



# ACE

## Engineering College

### An Autonomous Institution

All the courses are Accredited by NBA and NAAC with A Grade, Affiliated to JNTUH

Ankushapur ,Ghatkesar ,Medchal,Hyderabad-501301

## DEPARTMENT OF INFORMATION TECHNOLOGY

### COURSE STRUCTURE

R20 B.TECH IT II YEAR II SEMESTER

II B.Tech II Semester


S.No	Course Type	Course Code	Course Title	Periods Per Week			Credits
				L	T	P	
1	PCC	CS401PC	Discrete Mathematics	3	0	0	3
2	HSMC	SM402MS	Business Economics & Financial Analysis	3	0	0	3
3	PCC	CS403PC	Operating Systems	3	0	0	3
4	PCC	CS404PC	Database Management Systems	3	1	0	4
5	PCC	CS405PC	Java Programming	3	1	0	4
6	PCC	CS406PC	Operating Systems Lab	0	0	3	1.5
7	PCC	CS407PC	Database Management Systems Lab	0	0	3	1.5
8	PCC	CS408PC	Java Programming Lab	0	0	2	1
9	MC	*MC410	Constitution of India	3	0	0	0
10	MC	*MC411IT	Python Programming -II	1	0	2	0
Total Credits				19	2	10	21

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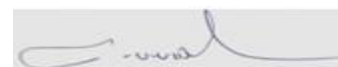
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## CS401PC: DISCRETE MATHEMATICS

B.Tech. II Year II Semester								
Course Code	Category	Hours/Week			Credits	Maximum Marks		
CS401PC	PCC	L	T	P	C	CIA	SEE	Total
		3	0	0	3	30	70	100
<b>Contact Classes: 45</b>	<b>Tutorial Classes: 15</b>	<b>Practical Classes: 0</b>			<b>Total Classes: 60</b>			
<p><b>Prerequisite:</b> An understanding of Mathematics in general is sufficient</p>								
<p><b>Course Objectives:</b></p> <ul style="list-style-type: none"> <li>• Introduces the elementary discrete mathematics for computer science and engineering.</li> <li>• Topics include formal logic notation, methods of proof, induction, sets, relations, graph theory, permutations and combinations, counting principles; recurrence relations and generating functions.</li> </ul>								
<p><b>Course Outcomes:</b></p> <ul style="list-style-type: none"> <li>• Ability to understand and construct precise mathematical proofs</li> <li>• Ability to use logic and set theory to formulate precise statements</li> <li>• Ability to analyze and solve counting problems on finite and discrete structures</li> <li>• Ability to describe and manipulate sequences</li> <li>• Ability to apply graph theory in solving computing problems</li> </ul>								
<b>Unit - 1</b>	<b>The Foundations: Logic and Proofs</b>					<b>No. of Classes:9</b>		
<p><b>The Foundations: Logic and Proofs:</b> Propositional Logic, Applications of Propositional Logic, Propositional Equivalence, Predicates and Quantifiers, Nested Quantifiers, Rules of Inference, Introduction to Proofs, Proof Methods and Strategy.</p>								
<b>Unit - 2</b>	<b>Basic Structures</b>					<b>No. of Classes:9</b>		
<p>Basic Structures, Sets, Functions, Sequences, Sums, Matrices and Relations Sets, Functions, Sequences &amp; Summations, Cardinality of Sets and Matrices Relations, Relations and Their Properties, n-ary Relations and Their Applications, Representing Relations, Closures of Relations, Equivalence Relations, Partial Orderings.</p>								
<b>Unit - 3</b>	<b>Algorithms, Induction and Recursion</b>					<b>No. of Classes:8</b>		
<p>Algorithms, The Growth of Functions, Complexity of Algorithms</p> <p><b>Induction and Recursion:</b> Mathematical Induction, Strong Induction and Well-Ordering, Recursive Definitions and Structural Induction, Recursive Algorithms, Program Correctness</p>								
<b>Unit - 4</b>	<b>Discrete Probability and Advanced Counting Techniques</b>					<b>No. of Classes:10</b>		



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**Discrete Probability and Advanced Counting Techniques** : An Introduction to Discrete Probability, Probability Theory, Bayes' Theorem, Expected Value and Variance

**Advanced Counting Techniques:** Solving Linear Recurrence Relations, Divide-and-Conquer Algorithms and Recurrence Relations, Generating Functions, **Algebraic Structures, Semi-group and Monoids, Group Theory, Residue Arithmetic.**

**Unit - 5**

**Graphs**

**No. of Classes:9**

**Graphs:** Graphs and Graph Models, Graph Terminology and Special Types of Graphs, Representing Graphs and Graph Isomorphism, Connectivity, Euler and Hamilton Paths, Shortest-Path Problems, Planar Graphs, Graph Coloring.


**Trees:** Introduction to Trees, Applications of Trees, Tree Traversal, Spanning Trees, Minimum Spanning Trees

**Text Books:**

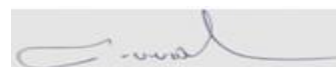
1. Discrete Mathematics and its Applications with Combinatorics and Graph Theory- Kenneth H Rosen, 7<sup>th</sup>Edition, TMH.

**Reference Books:**

1. Discrete Mathematical Structures with Applications to Computer Science-J.P. Tremblay and R. Manohar, TMH,
2. Discrete Mathematics for Computer Scientists & Mathematicians: Joe L. Mott, Abraham Kandel, Theodore P. Baker, 2<sup>nd</sup>ed, Pearson Education.
3. Discrete Mathematics- Richard Johnsonbaugh, 7<sup>th</sup>Edn., Pearson Education.
4. Discrete Mathematics with Graph Theory- Edgar G. Goodaire, Michael M. Parmenter.
5. Discrete and Combinatorial Mathematics - an applied introduction: Ralph.P. Grimald, 5<sup>th</sup>edition, Pearson Education.



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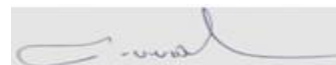
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## SM402MS: BUSINESS ECONOMICS &amp; FINANCIAL ANALYSIS

B.Tech. II Year II Semester								
Course Code	Category	Hours/Week			Credits	Maximum Marks		
SM402MS	HSMC	L	T	P	C	CIA	SEE	Total
		3	0	0	3	30	70	100
Contact Classes: 45	Tutorial Classes: 15	Practical Classes: Nil			Total Classes: 60			
<b>Prerequisite: Nil</b>								
<b>Course Objectives:</b>								
<ul style="list-style-type: none"> <li>To learn the basic Business types, impact of the Economy on Business and Firms specifically.</li> <li>To analyze the Business from the Financial Perspective.</li> </ul>								
<b>Course Outcomes:</b>								
<ul style="list-style-type: none"> <li>The students will understand the various Forms of Business and the impact of economic variables on the Business.</li> <li>The Demand, Supply, Production, Cost, Market Structure, Pricing aspects are learnt.</li> <li>The Students can study the firm's financial position by analysing the Financial Statements of a Company.</li> </ul>								
<b>Unit-I</b>	<b>INTRODUCTION TO BUSINESS AND ECONOMICS</b>					<b>No. of Classes: 10</b>		
<p><b>Business:</b> Structure of Business Firm, Theory of Firm, Types of Business Entities, Limited Liability Companies, Sources of Capital for a Company, Non-Conventional Sources of Finance.</p> <p><b>Economics:</b> Significance of Economics, Micro and Macro Economic Concepts, Concepts and Importance of National Income, Inflation, Money Supply in Inflation, Business Cycle, Features and Phases of Business Cycle. Nature and Scope of Business Economics, Role of Business Economist, Multidisciplinary nature of Business Economics.</p>								
<b>Unit-II</b>	<b>DEMAND AND SUPPLY ANALYSIS</b>					<b>No. of Classes: 08</b>		
<p><b>Elasticity of Demand:</b> Elasticity, Types of Elasticity, Law of Demand, Measurement and Significance of Elasticity of Demand, Factors affecting Elasticity of Demand, Elasticity of Demand in decision making, Demand Forecasting: Characteristics of Good Demand Forecasting, Steps in Demand Forecasting, Methods of Demand Forecasting.</p> <p><b>Supply Analysis:</b> Determinants of Supply, Supply Function &amp; Law of Supply.</p>								
<b>Unit-III</b>	<b>PRODUCTION, COST, MARKET STRUCTURES &amp; PRICING</b>					<b>No. of Classes: 10</b>		
<p><b>Production Analysis:</b> Factors of Production, Production Function, Production Function with one variable input, two variable inputs, Returns to Scale, Different Types of Production Functions.</p> <p><b>Cost analysis:</b> Types of Costs, Short run and Long run Cost Functions.</p> <p><b>Market Structures:</b> Nature of Competition, Features of Perfect competition, Monopoly, Oligopoly, Monopolistic Competition.</p> <p><b>Pricing:</b> Types of Pricing, Product Life Cycle based Pricing, Break Even Analysis, Cost Volume Profit Analysis.</p>								
<b>Unit-IV</b>	<b>FINANCIAL ACCOUNTING</b>					<b>No. of Classes: 10</b>		
Accounting concepts and Conventions, Accounting Equation, Double-Entry system of Accounting, Rules for maintaining Books of Accounts, Journal, Posting to Ledger, Preparation of Trial Balance, Elements of Financial Statements, Preparation of Final Accounts.								
<b>Unit-V</b>	<b>FINANCIAL ANALYSIS THROUGH RATIOS</b>					<b>No. of Classes: 07</b>		



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Concept of Ratio Analysis, Liquidity Ratios, Turnover Ratios, Profitability Ratios, Proprietary Ratios, Solvency, Leverage Ratios (simple problems).  
Introduction to Fund Flow and Cash Flow Analysis (simple problems).

**Text Books:**

1. D.D. Chaturvedi, S.L. Gupta, Business Economics - Theory and Applications, International Book House Pvt. Ltd.2013.
2. GeethikaGhosh,PiyaliGosh,PurbaRoyChoudhury,ManagerialEconomics,2e,TataMcGraw Hill Education Pvt. Ltd.2012.

**Reference Books:**


1. Paresh Shah, Financial Accounting for Management 2e, Oxford Press,2015.
2. S.N.Maheshwari,SunilKMaheshwari,SharadKMaheshwari,FinancialAccounting,5e,Vikas Publications,2013.

**Web References:**

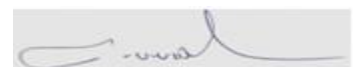
1. [https:// www.slideshare.net/glory1988/managerial-economics-and- financial analysis](https://www.slideshare.net/glory1988/managerial-economics-and-financial-analysis)
2. [https:// thenthata.web4kurd.net/mypdf/managerial-economics-and- financial analysis](https://thenthata.web4kurd.net/mypdf/managerial-economics-and-financial-analysis)
3. [https:// bookshallcold.link/pdfread/managerial-economics-and-financial analysis](https://bookshallcold.link/pdfread/managerial-economics-and-financial-analysis)
4. [https:// www.gvpce.ac.in/syllabi/Managerial Economics and financial analysis](https://www.gvpce.ac.in/syllabi/Managerial%20Economics%20and%20financial%20analysis)

**E-Text Books:**

1. [https:// books.google.co.in/books/about/Managerial economics and financial analysis](https://books.google.co.in/books/about/Managerial_economics_and_financial_analysis)
2. [http://www. ebooktake.in/pdf/title/managerial-economics-and-financial analysis](http://www.ebooktake.in/pdf/title/managerial-economics-and-financial-analysis)
3. [http://all4ryou.blogspot.in/2012/06/mefa-managerial-economics and financial analysis](http://all4ryou.blogspot.in/2012/06/mefa-managerial-economics-and-financial-analysis)
4. [http://books.google.com/books/about/Managerial economics and financial analysis](http://books.google.com/books/about/Managerial_economics_and_financial_analysis)



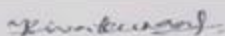
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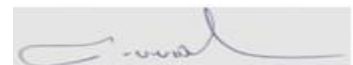
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**CS403PC: OPERATING SYSTEMS**

<b>B.Tech. II Year II Semester</b>								
Course Code	Category	Hours/Week			Credits	Maximum Marks		
CS403PC	PCC	L	T	P	C	CIA	SEE	Total
		3	0	0	3	30	70	100
<b>Contact Classes: 45</b>	<b>Tutorial Classes: 15</b>	<b>Practical Classes: Nil</b>			<b>Total Classes: 60</b>			
<b>Prerequisite:</b> <ul style="list-style-type: none"> <li>• A course on “Computer Programming and DataStructures”.</li> <li>• A course on “Computer Organization andArchitecture”.</li> </ul>								
<b>Course Objectives:</b> <ul style="list-style-type: none"> <li>• Provide an introduction to operating system concepts (i.e., processes, threads, scheduling, synchronization, deadlocks, memory management, file and I/O subsystems and protection)</li> <li>• Introduce the issues to be considered in the design and development of operating system</li> <li>• Introduce basic Unix commands, system call interface for process management, interprocess communication and I/O in Unix</li> </ul>								
<b>Course Outcomes:</b> <ul style="list-style-type: none"> <li>• Will be able to control access to a computer and the files that may be shared</li> <li>• Demonstrate the knowledge of the components of computer and their respective roles in computing.</li> <li>• Ability to recognize and resolve user problems with standard operating environments.</li> <li>• Gain practical knowledge of how programming languages, operating systems, and architectures interact and how to use each effectively.</li> </ul>								
<b>Unit- I</b>	<b>OPERATING SYSTEM</b>					<b>No.of Classes: 09</b>		
Introduction, Structures - Simple Batch, Multiprogrammed, Time-shared, Personal Computer, Parallel, Distributed Systems, Real-Time Systems, System components, Operating System services, System Calls								
<b>Unit-II</b>	<b>PROCESS AND CPU SCHEDULING</b>					<b>No.of Classes: 09</b>		
Process concepts and scheduling, Operations on processes, Cooperating Processes, Threads, and Interposes Communication, Scheduling Criteria, Scheduling Algorithms, Multiple - Processor Scheduling.								
<b>System call interface for process management-fork, exit, wait, waitpid, exec</b>								
<b>Unit- III</b>	<b>DEADLOCKS</b>					<b>No.of Classes: 09</b>		
System Model, Deadlocks Characterization, Methods for Handling Deadlocks, Deadlock Prevention, Deadlock Avoidance, Deadlock Detection, and Recovery from Deadlock								
<b>Process Management and Synchronization</b> - The Critical Section Problem, Synchronization Hardware, Semaphores, and Classical Problems of Synchronization, Critical Regions, Monitors <b>Interprocess Communication Mechanisms:</b> IPC between processes on a single computer system, IPC between processes on different systems, using pipes, FIFOs, message queues, shared memory.								
<b>Unit-IV</b>	<b>MEMORY MANAGEMENT AND VIRTUAL MEMORY</b>					<b>No.of Classes: 09</b>		
Logical versus Physical Address Space, Swapping, Contiguous Allocation, Paging, Segmentation, Segmentation with Paging, Demand Paging, Page Replacement, Page Replacement Algorithms.								
<b>Unit-V</b>	<b>FILESYSTEMINTERFACEANDOPERATIONS</b>					<b>No.of Classes: 09</b>		



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Access methods, Directory Structure, Protection, File System Structure, Allocation methods, Free-space Management. Usage of open, create, read, write, close, lseek, stat, ioctl systemcalls

**Text Books:**

1. Operating System Principles- Abraham Silberchatz, Peter B. Galvin, Greg Gagne 7<sup>th</sup> Edition, JohnWiley
2. Advanced programming in the UNIX environment, W.R. Stevens, Pearsoneducation.

**Reference Books:**

1. Operating Systems – Internals and Design Principles Stallings, Fifth Edition–2005, Pearson Education/PHI
2. Operating System A Design Approach- Crowley, TMH.
3. Modern Operating Systems, Andrew S. Tanenbaum 2<sup>nd</sup> edition, Pearson/PHI
4. UNIX programming environment, Kernighan and Pike, PHI/ PearsonEducation
5. UNIX Internals -The New Frontiers, U. Vahalia, PearsonEducation.

**Web References:**

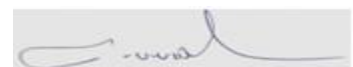
1. <http://www.freebookcentre.net/ComputerScience-Books-Download/Operating-System-Guru-Jambheshwar-University-of-Science-and-Technology.html>
2. <https://www.pdfdrive.com/operating-systems-e18726938.html>
3. <https://www.topfreebooks.org/free-operating-systems-books/>

**E-Text Books:**

1. [https://books.google.co.in/books?id=WjvX0HmVTIMC&printsec=frontcover&source=gbs\\_vpt\\_buy#v=onepage&q&f=false](https://books.google.co.in/books?id=WjvX0HmVTIMC&printsec=frontcover&source=gbs_vpt_buy#v=onepage&q&f=false)
2. <https://easyengineering.net/operating-systems-by-deitel/>




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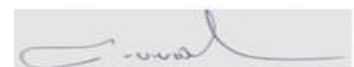
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**CS404PC: DATABASE MANAGEMENT SYSTEMS**

<b>B.Tech. II Year II Semester</b>								
<b>Course Code</b>	<b>Category</b>	<b>Hours/Week</b>			<b>Credits</b>	<b>Maximum Marks</b>		
		<b>L</b>	<b>T</b>	<b>P</b>		<b>C</b>	<b>CIA</b>	<b>SEE</b>
<b>CS404PC</b>	<b>PCC</b>	3	1	0	4	30	70	100
<b>Contact Classes: 45</b>	<b>Tutorial Classes: 15</b>	<b>Practical Classes: Nil</b>			<b>Total Classes: 60</b>			
<b>Prerequisite:</b> A course on "Data Structures".								
<b>Course Objectives:</b>								
<ul style="list-style-type: none"> <li>To understand the basic concepts and the applications of database systems.</li> <li>To master the basics of SQL and construct queries using SQL.</li> <li>Topics include data models, database design, relational model, relational algebra, transaction control, concurrency control, storage structures and access techniques.</li> </ul>								
<b>Course Outcomes:</b>								
<ul style="list-style-type: none"> <li>Gain knowledge of fundamentals of DBMS, database design and normal forms</li> <li>Master the basics of SQL for retrieval and management of data.</li> <li>Be acquainted with the basics of transaction processing and concurrency control.</li> <li>Familiarity with database storage structures and access techniques</li> </ul>								
<b>Unit- I</b>	<b>DATABASE SYSTEM APPLICATIONS</b>					<b>No.of Classes: 09</b>		
<p>A Historical Perspective, File Systems versus a DBMS, the Data Model, Levels of Abstraction in a DBMS, Data Independence, Structure of a DBMS</p> <p>Introduction to Database Design: Database Design and ER Diagrams, Entities, Attributes, and Entity Sets, Relationships and Relationship Sets, Additional Features of the ER Model, Conceptual Design With the ER Model</p>								
<b>Unit- II</b>	<b>INTRODUCTION TO THE RELATIONAL MODEL</b>					<b>No.of Classes: 09</b>		
<p>Integrity constraint over relations, enforcing integrity constraints, querying relational data, logical database design, introduction to views, destroying/altering tables and views.</p> <p>Relational Algebra, Tuple relational Calculus, Domain relational calculus.</p>								
<b>Unit- III</b>	<b>SQL</b>					<b>No.of Classes: 09</b>		
<p>QUERIES, CONSTRAINTS, TRIGGERS form of basic SQL query, UNION, INTERSECT, and EXCEPT, Nested Queries, aggregation operators, NULL values, complex integrity constraints in SQL, triggers and active data bases.</p> <p>Schema Refinement: Problems caused by redundancy, decompositions, problems related to decomposition, reasoning about functional dependencies, FIRST, SECOND, THIRD normal forms, BCNF, lossless join decomposition, multi-valued dependencies, FOURTH normal form, FIFTH normal form.</p>								
<b>Unit- IV</b>	<b>TRANSACTION CONCEPT</b>					<b>No.of Classes: 09</b>		
<p>Transaction State, Implementation of Atomicity and Durability, Concurrent Executions, Serializability, Recoverability, Implementation of Isolation, Testing for serializability, Lock Based Protocols, Timestamp Based Protocols, Validation- Based Protocols, Multiple Granularity, Recovery and Atomicity, Log-Based Recovery, Recovery with Concurrent Transactions.</p>								




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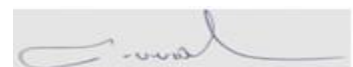


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Unit-V	DATA ON EXTERNAL STORAGE	No.of Classes: 09
<p>File Organization and Indexing, Cluster Indexes, Primary and Secondary Indexes, Index data Structures, Hash Based Indexing, Tree base Indexing, Comparison of File Organizations, Indexes and Performance Tuning, Intuitions for tree Indexes, Indexed Sequential Access Methods (ISAM), B+ Trees: A Dynamic Index Structure.</p>		
<p><b>Text Books:</b></p> <ol style="list-style-type: none"> <li>1. Database Management Systems, Raghurama Krishnan, Johannes Gehrke, <i>Tata Mc GrawHill</i> 3rd Edition</li> <li>2. Database System Concepts, Silberschatz, Korth, <i>Mc Graw hill</i>, Vediton.</li> </ol>		
<p><b>Reference Books:</b></p> <ol style="list-style-type: none"> <li>1. Database Systems design, Implementation, and Management, Peter Rob &amp; Carlos Coronel 7th Edition.</li> <li>2. Fundamentals of Database Systems, Elmasri Navrate, <i>Pearson Education</i></li> </ol>		
<ol style="list-style-type: none"> <li>3. Introduction to Database Systems, C. J. Date, <i>Pearson Education</i></li> <li>4. Oracle for Professionals, The X Team, S. Shah and V. Shah, <i>SPD</i>.</li> <li>5. Database Systems Using Oracle: A Simplified guide to SQL and PL/SQL, Shah, <i>PHI</i>.</li> <li>6. Fundamentals of Database Management Systems, M. L. Gillenson, <i>Wiley Student Edition</i>.</li> </ol>		
<p><b>Web References:</b></p> <ol style="list-style-type: none"> <li>1. <a href="https://www.pdfdrive.com/database-management-system-dbms-tutorial-tutorials-point-e10969892.html">https://www.pdfdrive.com/database-management-system-dbms-tutorial-tutorials-point-e10969892.html</a></li> <li>2. <a href="http://www.lincoste.com/ebooks/english/pdf/computers/database_management_systems.pdf">http://www.lincoste.com/ebooks/english/pdf/computers/database_management_systems.pdf</a></li> <li>3. <a href="http://www.freebookcentre.net/database-books-download/Database-Management-Systems-by-Rich-Maclin.html">http://www.freebookcentre.net/database-books-download/Database-Management-Systems-by-Rich-Maclin.html</a></li> </ol>		
<p><b>E-Text Books:</b></p> <ol style="list-style-type: none"> <li>1. <a href="https://books.google.co.in/books?id=dkg8BAAAOBAJ&amp;lpg=PP1&amp;dq=database%20management%20system%20by%20raghuramakrishnan&amp;pg=PP1#v=onepage&amp;q&amp;f=false">https://books.google.co.in/books?id=dkg8BAAAOBAJ&amp;lpg=PP1&amp;dq=database%20management%20system%20by%20raghuramakrishnan&amp;pg=PP1#v=onepage&amp;q&amp;f=false</a></li> </ol>		




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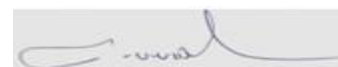
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## CS405PC: JAVA PROGRAMMING

B.Tech. II Year II Semester								
Course Code	Category	Hours/Week			Credits	Maximum Marks		
		L	T	P		C	CIA	SEE
CS405PC	PCC	3	1	0	4	30	70	100
		Contact Classes: 45			Tutorial Classes: 15		Practical Classes: Nil	
<b>Prerequisite:</b>								
<b>Course Objectives:</b>								
<ul style="list-style-type: none"> <li>To introduce the object oriented programming concepts.</li> <li>To understand object oriented programming concepts, and apply them in solving problems.</li> <li>To introduce the principles of inheritance and polymorphism; and demonstrate how they relate to the design of abstract classes</li> <li>To introduce the implementation of packages and interfaces</li> <li>To introduce the concepts of exception handling and multithreading.</li> <li>To introduce the design of Graphical User Interface using applets and swing controls.</li> </ul>								
<b>Course Outcomes:</b>								
<ul style="list-style-type: none"> <li>Able to solve real world problems using OOP techniques.</li> <li>Able to understand the use of abstract classes.</li> <li>Able to solve problems using java collection framework and I/O classes.</li> <li>Able to develop multithreaded applications with synchronization.</li> <li>Able to develop applets for web applications.</li> <li>Able to design GUI based applications</li> </ul>								
<b>Unit - 1</b>	<b>Object-Oriented Thinking</b>					<b>No. of Classes:12</b>		
<p><b>Object-Oriented Thinking-</b> A way of viewing world – Agents and Communities, messages and methods, Responsibilities, Classes and Instances, Class Hierarchies- Inheritance, Method binding, Overriding and Exceptions, Summary of Object- Oriented concepts. Java buzzwords, An Overview of Java, Data types, Variables and Arrays, operators, expressions, control statements, Introducing classes, Methods and Classes, String handling.</p> <p><b>Inheritance</b>– Inheritance concept, Inheritance basics, Member access, Constructors, Creating Multilevel hierarchy, super uses, using final with inheritance, Polymorphism- ad hoc polymorphism, pure polymorphism, method overriding, abstract classes, Object class, forms of inheritance- specialization, specification, construction, extension, limitation, combination, benefits of inheritance, costs of inheritance.</p>								
<b>Unit - 2</b>	<b>Packages</b>					<b>No. of Classes:12</b>		




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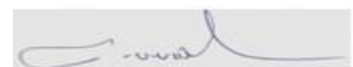


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<p><b>Packages-</b> Defining a Package, CLASSPATH, Access protection, importing packages.  <b>Interfaces-</b> defining an interface, implementing interfaces, Nested interfaces, applying interfaces, variables in interfaces and extending interfaces.  <b>Stream based I/O (java.io)</b> – The Stream classes-Byte streams and Character streams, Reading console Input and Writing Console Output, File class, Reading and writing Files, Random access file operations, The Console class, Serialization, Enumerations, auto boxing, generics.</p>		
<b>Unit - 3</b>	<b>Exception handling</b>	<b>No. of Classes:12</b>
<p><b>Exception handling</b> - Fundamentals of exception handling, Exception types, Termination or resumptive models, Uncaught exceptions, using try and catch, multiple catch clauses, nested try statements, throw, throws and finally, built- in exceptions, creating own exception sub classes.  <b>Multithreading-</b> Differences between thread-based multitasking and process-based multitasking, Java thread model, creating threads, thread priorities, synchronizing threads, inter thread communication.</p>		
<b>Unit - 4</b>	<b>Collections Framework</b>	<b>No. of Classes:12</b>
<p><b>The Collections Framework (java.util)-</b> Collections overview, Collection Interfaces, The Collection classes- Array List, Linked List, Hash Set, Tree Set, Priority Queue, Array Deque. Accessing a Collection via an Iterator, Using an Iterator, The For-Each alternative, Map Interfaces and Classes, Comparators, Collection algorithms, Arrays, The Legacy Classes and Interfaces- Dictionary, Hashtable ,Properties, Stack, Vector More Utility classes, String Tokenizer, Bit Set, Date, Calendar, Random, Formatter, Scanner</p>		
<b>Unit - 5</b>	<b>GUI Programming</b>	<b>No. of Classes:12</b>
<p><b>GUI Programming with Swing</b> – Introduction, limitations of AWT, MVC architecture, components, containers. Understanding Layout Managers, Flow Layout, Border Layout, Grid Layout, Card Layout, Grid Bag Layout.  <b>Event Handling-</b> The Delegation event model- Events, Event sources, Event Listeners, Event classes, Handling mouse and keyboard events, Adapter classes, Inner classes, Anonymous Inner classes.  <b>A Simple Swing Application, Applets</b> – Applets and HTML, Security Issues, Applets and Applications, passing parameters to applets. Creating a Swing Applet, Painting in Swing, A Paint example, Exploring Swing Controls- JLabel and Image Icon, JText Field,  <b>The Swing Buttons-</b> JButton, JToggle Button, JCheck Box, JRadio Button, JTabbed Pane, JScroll Pane, JList, JCombo Box, Swing Menus, Dialogs.</p>		
<p><b>Text Books:</b></p> <ol style="list-style-type: none"> <li>1. Java The complete reference, 9<sup>th</sup> edition, Herbert Schildt, McGraw Hill Education (India) Pvt. Ltd.</li> <li>2. Understanding Object-Oriented Programming with Java, updated edition, T. Budd, Pearson Education.</li> </ol>		



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**Reference Books:**

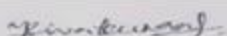
1. An Introduction to programming and OO design using Java, J. Nino and F.A. Hosch, John Wiley & sons
2. Introduction to Java programming, Y. Daniel Liang, Pearson Education.
3. Object Oriented Programming through Java, P. Radha Krishna, University Press.
4. Programming in Java, S. Malhotra, S. Chudhary, 2<sup>nd</sup> edition, Oxford Univ. Press.
5. Java Programming and Object-oriented Application Development, R. A. Johnson, Cengage Learning.

**Web References:**

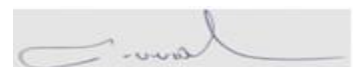
1. <https://nptel.ac.in/courses/106/105/106105191/>

**E-Text Books:**

1. <https://www.oracle.com/technetwork/java/newtojava/java8book-2172125.pdf>



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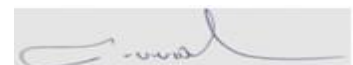
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## CS406PC: OPERATING SYSTEMS Lab

B.Tech. II Year II Semester								
Course Code	Category	Hours/Week			Credits	Maximum Marks		
CS406PC	PCC	L	T	P	C	CIA	SEE	Total
		0	0	3	1.5	30	70	100
Contact Classes: 0	Tutorial Classes: 0	Practical Classes:45			Total Classes:45			
<b>Prerequisite:</b> <ul style="list-style-type: none"> <li>• A course on “Programming for Problem Solving”.</li> <li>• A course on “Computer Organization and Architecture”.</li> </ul>								
<b>Course Objectives:</b> <ul style="list-style-type: none"> <li>• To provide an understanding of the design aspects of operating system concepts through simulation</li> <li>• Introduce basic Unix commands, system call interface for process management, inter-process communication and I/O in Unix</li> </ul>								
<b>Course Outcomes:</b> <ul style="list-style-type: none"> <li>• Simulate and implement operating system concepts such as scheduling, deadlock management, file management and memory management.</li> <li>• Able to implement C programs using Unix system calls</li> </ul>								
<b>List of Experiments:</b> <ol style="list-style-type: none"> <li>Write C programs to simulate the following CPU Scheduling algorithms           <ol style="list-style-type: none"> <li>FCFS</li> <li>SJF</li> <li>Round Robin</li> <li>priority</li> </ol> </li> <li>Write programs using the I/O system calls of UNIX/LINUX operating system (open, read, write, close, fcntl, seek, stat, opendir, readdir)</li> <li>Write a C program to simulate Bankers Algorithm for Deadlock Avoidance and Prevention.</li> <li>Write a C program to implement the Producer – Consumer problem using semaphores using UNIX/LINUX system calls.</li> <li>Write C programs to illustrate the following IPC mechanisms           <ol style="list-style-type: none"> <li>Pipes</li> <li>FIFOs</li> <li>Message Queues</li> <li>Shared Memory</li> </ol> </li> </ol>								



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6. Write C programs to simulate the following memory management techniques
- a) Paging                      b) Segmentation

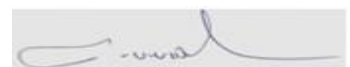
**List of Equipment/Software (with Specifications or Range) Required:**  
A Computer System with Ubuntu operating system and GCC Compiler

**References**

1. Operating Systems – Internals and Design Principles, William Stallings, Fifth Edition–2005, PearsonEducation/PHI
2. Operating System - A Design Approach-Crowley, TMH.
3. Modern Operating Systems, Andrew S Tanenbaum, 2<sup>nd</sup> edition, Pearson/PHI
4. UNIX Programming Environment, Kernighan and Pike, PHI/PearsonEducation
5. UNIX Internals: The New Frontiers, U. Vahalia, PearsonEducation




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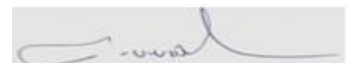
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**CS407PC: DATABASE MANAGEMENT SYSTEMS LAB**

<b>B.Tech. II Year II Semester</b>								
Course Code	Category	Hours/Week			Credits	Maximum Marks		
		L	T	P		C	CIA	SEE
<b>CS407PC</b>	PCC	0	0	3	1.5	30	70	100
		<b>Contact Classes: 0</b>		<b>Tutorial Classes: 0</b>		<b>Practical Classes: 45</b>		<b>Total Classes:45</b>
<b>Prerequisite:</b> Nil								
<b>Course Objectives:</b>								
<ul style="list-style-type: none"> <li>• Introduce ER data model, database design and normalization</li> <li>• Learn SQL basics for data definition and data manipulation</li> </ul>								
<b>Course Outcomes:</b>								
<ul style="list-style-type: none"> <li>• Design database schema for a given application and apply normalization</li> <li>• Acquire skills in using SQL commands for data definition and data manipulation.</li> <li>• Develop solutions for database applications using procedures, cursors and triggers</li> </ul>								
<b>List of Experiments:</b>								
<ol style="list-style-type: none"> <li>1. Concept design with E-RModel</li> <li>2. Relational Model</li> <li>3. Normalization</li> <li>4. Practicing DDL commands</li> <li>5. Practicing DML commands</li> <li>6. Querying (using ANY, ALL, IN, Exists, NOT EXISTS, UNION, INTERSECT, Constraint setc.)</li> <li>7. Queries using Aggregate functions, GROUP BY, HAVING and Creation and dropping of Views.</li> <li>8. Triggers (Creation of insert trigger, delete trigger, updatetrigger)</li> <li>9. Procedures</li> <li>10. Usage of Cursors</li> </ol>								
<b>List of Equipment/Software (with Specifications or Range) Required:</b>								
<ul style="list-style-type: none"> <li>• System with MySQL / Oracle</li> </ul>								




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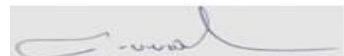
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## References

1. Database Systems design, Implementation, and Management, Peter Rob & Carlos Coronel 7thEdition.
2. Fundamentals of Database Systems, ElmasriNavrate, *PearsonEducation*
3. Introduction to Database Systems, C.J. Date, *PearsonEducation*
4. Oracle for Professionals, The X Team, S. Shah and V. Shah,*SPD*.
5. Database Systems Using Oracle: A Simplified guide to SQL and PL/SQL, Shah,*PHI*.
6. Fundamentals of Database Management Systems, M. L. Gillenson, *Wiley StudentEdition*.



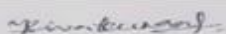
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## CS408PC: JAVA PROGRAMMING LAB

B.Tech. II Year II Semester									
Course Code	Category	Hours/Week			Credits	Maximum Marks			
CS408PC	PCC	L	T	P	C	CIA	SEE	Total	
		0	0	2	1	30	70	100	
Contact Classes: 0	Tutorial Classes: 0	Practical Classes:45			Total Classes:45				
<b>Prerequisite:</b> Nil									
<b>Course Objectives:</b>									
<ul style="list-style-type: none"> <li>To write programs using abstract classes.</li> <li>To write programs for solving real world problems using java collection framework.</li> <li>To write multithreaded programs.</li> <li>To write GUI programs using swing controls in Java.</li> <li>To introduce java compiler and eclipse platform.</li> <li>To impart hands on experience with java programming.</li> </ul>									
<b>Course Outcomes:</b>									
<ul style="list-style-type: none"> <li>Able to write programs for solving real world problems using java collection framework.</li> <li>Able to write programs using abstract classes.</li> <li>Able to write multithreaded programs.</li> <li>Able to write GUI programs using swing controls in Java.</li> </ul>									
<b>List of Experiments:</b>									
<ol style="list-style-type: none"> <li>Use Eclipse or Net bean platform and acquaint with the various menus. Create a test project, add a test class, and run it. See how you can use auto suggestions, auto fill. Try code formatter and code refactoring like renaming variables, methods, and classes. Try debug step by step with a small program of about 10 to 15 lines which contains at least one if else condition and a for loop.</li> <li>Write a Java program that works as a simple calculator. Use a grid layout to arrange buttons for the digits and for the +, -, *, % operations. Add a text field to display the result. Handle any possible exceptions like divided by zero.</li> <li> <ol style="list-style-type: none"> <li>Develop an applet in Java that displays a simple message.</li> <li>Develop an applet in Java that receives an integer in one text field, and computes its factorial Value and returns it in another text field, when the button named "Compute" is clicked.</li> </ol> </li> <li>Write a Java program that creates a user interface to perform integer divisions.</li> </ol>									



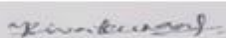
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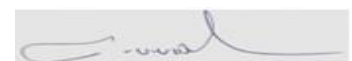
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The user enters two numbers in the text fields, Num1 and Num2. The division of Num1 and Num 2 is displayed in the Result field when the Divide button is clicked. If Num1 or Num2 were not an integer, the program would throw a Number Format Exception. If Num2 were Zero, the program would throw an Arithmetic Exception. Display the exception in a message dialog box.

5. Write a Java program that implements a multi-thread application that has three threads. First thread generates random integer every 1 second and if the value is even, second thread computes the square of the number and prints. If the value is odd, the third thread will print the value of cube of the number.
6. Write a Java program for the following: Create a doubly linked list of elements. Delete a given element from the above list. Display the contents of the list after deletion.
7. Write a Java program that simulates a traffic light. The program lets the user select one of three lights: red, yellow, or green with radio buttons. On selecting a button, an appropriate message with "Stop" or "Ready" or "Go" should appear above the buttons in selected color. Initially, there is no message shown.
8. Write a Java program to create an abstract class named Shape that contains two integers and an empty method named print Area (). Provide three classes named Rectangle, Triangle, and Circle such that each one of the classes extends the class Shape. Each one of the classes contains only the method print Area () that prints the area of the given shape.
9. Suppose that a table named Table.txt is stored in a text file. The first line in the file is the header, and the remaining lines correspond to rows in the table. The elements are separated by commas. Write a java program to display the table using Labels in Grid Layout.
10. Write a Java program that handles all mouse events and shows the event name at the center of the window when a mouse event is fired (Use Adapter classes).
11. Write a Java program that loads names and phone numbers from a text file where the data is organized as one line per record and each field in a record are separated by a tab (\t). It takes a name or phone number as input and prints the corresponding other value from the hash table (hint: use hash tables).
12. Write a Java program that correctly implements the producer – consumer problem using the concept of interthread communication.
13. Write a Java program to list all the files in a directory including the files present in all its subdirectories.
14. Write a Java program that implements Quick sort algorithm for sorting a list of names in ascending order
15. Write a Java program that implements Bubble sort algorithm for sorting in descending order and also shows the number of interchanges occurred for the given set of integers.



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**List of Equipment/Software (with Specifications or Range) Required:**


- Ubuntu System
- Eclipse or Net bean

**References**

1. Java for Programmers, P. J. Deitel and H. M. Deitel, 10<sup>th</sup> Edition  
*Pearson*education.
2. Thinking in Java, Bruce Eckel, *Pearson*Education.
3. Java Programming, D. S. Malik and P. S. Nair, *Cengage*Learning.
4. Core Java, Volume 1, 9<sup>th</sup>edition, Cay S. Horstmann and G Cornell, *Pearson*.



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**\*MC410: CONSTITUTION OF INDIA**

B.Tech. II Year II Semester								
Course Code	Category	Hours/Week			Credits	Maximum Marks		
<b>*MC410</b>	MC	L	T	P	C	CIA	SEE	Total
		3	0	0	0	30	70	100
Contact Classes: Nil	Tutorial Classes: Nil	Practical Classes: 45			Total Classes: 45			
<b>Prerequisite: Nil</b>								


**Course Objectives:**

The Constitution of India is the supreme law of India. Parliament of India cannot make any law which violates the Fundamental Rights enumerated under the Part III of the Constitution. The Parliament of India has been empowered to amend the Constitution under Article 368, however, it cannot use this power to change the “basic structure” of the constitution, which has been ruled and explained by the Supreme Court of India in its historical judgments. The Constitution of India reflects the idea of “Constitutionalism” – a modern and progressive concept historically developed by the thinkers of “liberalism” – an ideology which has been recognized as one of the most popular political ideology and result of historical struggles against arbitrary use of sovereign power by state. The historic revolutions in France, England, America and particularly European Renaissance and Reformation movement have resulted into progressive legal reforms in the form of “constitutionalism” in many countries. The Constitution of India was made by borrowing models and principles from many countries including United Kingdom and America.

The Constitution of India is not only a legal document but it also reflects social, political and economic perspectives of the Indian Society. It reflects India’s legacy of “diversity”. It has been said that Indian constitution reflects ideals of its freedom movement; however, few critics have argued that it does not truly incorporate our own ancient legal heritage and cultural values. No law can be “static” and therefore the Constitution of India has also been amended more than one hundred times. These amendments reflect political, social and economic developments since the year 1950. The Indian judiciary and particularly the Supreme Court of India has played an historic role as the guardian of people. It has been protecting not only basic ideals of the Constitution but also strengthened the same through progressive interpretations of the text of the Constitution. The judicial activism of the Supreme Court of India and its historic contributions has been recognized throughout the world and it gradually made it “as one of the strongest court in the world”.



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**List of Experiments:**

**Course content**

1. Meaning of the constitution law and constitutionalism
2. Historical perspective of the Constitution of India
3. Salient features and characteristics of the Constitution of India
4. Scheme of the fundamental rights
5. The scheme of the Fundamental Duties and its legal status
6. The Directive Principles of State Policy – Its importance and implementation
7. Federal structure and distribution of legislative and financial powers between the Union and the States
8. Parliamentary Form of Government in India – The constitution powers and status of the President of India
9. Amendment of the Constitutional Powers and Procedure
10. The historical perspectives of the constitutional amendments in India
11. Emergency Provisions: National Emergency, President Rule, Financial Emergency
12. Local Self Government – Constitutional Scheme in India
13. Scheme of the Fundamental Right to Equality
14. Scheme of the Fundamental Right to certain Freedom under Article 19
15. Scope of the Right to Life and Personal Liberty under Article 21



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## MC411IT: PYTHON PROGRAMMING –II LAB

B.Tech. II Year II Semester								
Course Code	Category	Hours/Week			Credits	Maximum Marks		
		L	T	P		CIA	SEE	Total
MC411IT	MC	-	-	2	0	30	70	100
Contact Classes: Nil	Tutorial Classes: Nil	Practical Classes: 32			Total Classes: 32			
<b>Prerequisite: Nil</b>								
<b>COURSE OBJECTIVE:</b> <b>At the end of the course students should be able to:</b> <ul style="list-style-type: none"><li>To learn how to write different types of Searching and sorting programs using Basic Python Knowledge</li><li>To learn how to solve critical problems with Python lab Knowledge</li></ul>								
<b>List of Experiments</b> <b>Searching and Sorting Programs:</b> <ol style="list-style-type: none"><li>Python Program for Binary Search (Recursive and Iterative)</li><li>Python Program for Linear Search</li><li>Python Program for Insertion Sort</li><li>Python Program for Recursive Insertion Sort</li><li>Python Program for Quick Sort</li><li>Python Program for Selection Sort</li><li>Python Program for Bubble Sort</li><li>Python Program for Merge Sort</li><li>Python Program for Heap Sort</li><li>Python Program for Shell Sort</li><li>Python Program for Topological Sorting</li><li>Python Program for Radix Sort</li></ol> <b>Exercise Programs:</b> <ol style="list-style-type: none"><li>Python Program to Reverse a linked list</li><li>Python Program for Find largest prime factor of a number</li><li>Python Program for Find sum of odd factors of a number</li><li>Python Program for Coin Change</li><li>Python Program for Tower of Hanoi</li><li>Python Program to Check if binary representation is palindrome</li><li>Python Program for Number of elements with odd factors in given range</li><li>Python Program for Common Divisors of Two Numbers</li><li>Python Program for GCD of more than two (or array) numbers</li><li>Python Program for Check if count of divisors is even or odd</li><li>Python Program for Difference between sums of odd and even digits</li><li>Python Program for Program to Print Matrix in Z form</li><li>Python Program for Smallest K digit number divisible by X</li><li>Python Program for Print Number series without using any loop</li><li>Python Program for Program to calculate area of a Tetrahedron</li><li>Python Program for Find the perimeter of a cylinder</li></ol>								



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17. Python Program for Finding the vertex, focus and directrix of a parabola
18. Python Program for Check if all digits of a number divide it
19. Python program to convert float decimal to Octal number
- 20 Python program to check if a string contains all unique characters

### **Visualization of Different Distributions**

- Random Permutations of Elements
- Random Data Distribution
- Normal Distribution
- Poisson Distribution
- Uniform Distribution
- Logistic Distribution
- Multinomial Distribution
- Exponential Distribution
- Chi Square Distribution
- Rayleigh Distribution
- Pareto Distribution
- Zipf Distribution
- Binomial Distribution

### **Using NumPy and Pandas**



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