

Lagrangian formulation for equations of motion for RP, RR serial manipulators,

Unit-IV

Dynamics of serial manipulators

Recursive dynamics using Newton-Euler formulation of RP and RR serial manipulator.

UNIT-V

Trajectory Generation

Joint-Space Techniques: Cubic Polynomial Trajectories, Linear Segments with Parabolic Blends-without and with via points

Cartesian-Space Techniques: Straight line path, Circular Path, Position Planning, Orientation Planning.

Learning Resources:

1. Bruno Siciliano, Lorenzo Sciavicco, Luigi Villani, Giuseppe Oriolo, "Robotics: Modelling, Planning and Control", Springer Science & Business Media, 2010.
2. M.W.Spong and M.Vidyasagar, "Robot Dynamics and Control", 1st Edition, John Wiley and sons, 1990.
3. R.K.Mittal and I.J.Nagrath, "Robotics and Control", Tata McGraw-Hill, 2003.
4. Subir Kumar Saha, "Introduction to Robotics", Tata McGraw-Hill Education, 2014.
5. Howie M. Choset, Seth Hutchinson, Kevin M. Lynch, "Principles of Robot Motion: Theory, Algorithms, and Implementation", MIT Press, 2005.

The break-up of CIE: Internal Tests+ Assignments + Quizzes

1	No. of Internal Tests:	02	Max. Marks for each Internal Test:	30
2	No. of Assignments:	03	Max. Marks for each Assignment:	05
3	No. of Quizzes:	03	Max. Marks for each Quiz Test:	05

Duration of Internal Test: 90 Minutes

With effect from the Academic Year 2024-25
VASAVI COLLEGE OF ENGINEERING (Autonomous)

ACCREDITED BY NAAC WITH 'A++' GRADE
IBRAHIMBAGH, HYDERABAD – 500 031

DEPARTMENT OF MECHANICAL ENGINEERING

**OPERATIONS RESEARCH
(General Pool) (Open Elective-II)
SYLLABUS FOR B.E. IV-SEMESTER**

Instruction :3Hrs /week	SEE Marks: 60	Course Code:U23OE420ME
Credits :3	CIE Marks: 40	Duration of SEE: 3 Hours

Course Objectives	Course Outcomes
<p>The objectives of this course are to:</p> <p>understand the application of mathematics for real time problem solving to LPP, sensitivity analysis under set of constraints, applying mathematical techniques to solve transportation problem and assignment problems, applying time value money and ignoring the same to find the optimal replacement of machines, applying Johnsons rules to find the best sequence to minimize elapsed time and minimum no of servers to minimize waiting time of the customers and optimal utilisation of servers.</p>	<p>On completion of the course, the student will be able to:</p> <ol style="list-style-type: none">1. Apply optimization in multi disciplinary areas through linear programming under different working conditions.2. Analyze linear programming for a dynamic changes of a customer requirements to suit various Organizations.3. Reduce total cost to apply for transportation techniques for the transshipment of Goods and products for a product based industry.4. Estimate the time for replacement of a machine by considering or ignoring time value of money using individual/group replacement policy.5. Estimate elapsed time for sequencing problem processed through different machines. Minimize waiting time of the customer and optimization of no. of servers.

UNIT – I

Introduction: Definition and scope of operations research.

Linear programming: Introduction, Formulation of linear programming problems, graphical method of solving LP problem, Simplex method, maximization and minimization, degeneracy in LPP, unbounded and infeasible solutions. Introduction of software to solve LPP.

UNIT – II

Duality: Definition, Relationship between optimal primal and dual solutions. Economic interpretation, Post optimal analysis (restricted to variation of resources i.e., RHS), Dual simplex method.

UNIT-III

Transportation model: Finding an initial feasible solution– north west corner method, least cost method, Vogel’s approximation method, finding the optimal solution, optimal solution by stepping stone and MODI methods, special cases in transportation problems – Unbalanced transportation problem.

Assignment Problem: Hungarian method of assignment problem, maximization in assignment problem, unbalanced problem, problems with restrictions, travelling salesman problems.

UNIT-IV

Replacement models: Introduction, replacement of items that deteriorate ignoring change in money value, replacement of items that deteriorate considering change in money value with time, replacement of items that fail suddenly – individual replacement policy, group replacement policy.

Game theory: Introduction, 2 person zero sum games, maximin– minimax principle, principle of dominance, solution for mixed strategy problems graphical method for $2 \times n$ and $m \times 2$ games.

UNIT-V

Sequencing models: Introduction, general assumptions, processing n jobs through 2 machines, processing ‘ n ’ jobs through m machines processing 2 jobs through m machines.

Queuing theory: Introduction, single channel – poisson arrivals – exponential service times with infinite population and finite population.

Learning Resources:

1. Hamady A. Taha, “Operations Research – An introduction”, 6th Edition, PHI Pvt. Ltd., 1997.
2. S.D. Sharma, “Operations Research”, Kedarnath, Ramnath & Co., Meerut, 2009.
3. Harvey M. Wagner, “Principles of Operations Research”, 2nd Edition, PHI Pvt. Ltd., 1980.
4. V.K. Kapoor, “Operations Research”, S. Chand Publishers, New Delhi, 2004.
5. S.S.S. Rao, “Engineering Optimization – Theory and Practice”, 4th Edition, John Wiley & Sons Inc., 2009.

The break-up of CIE: Internal Tests+ Assignments + Quizzes

1	No. of Internal Tests:	02	Max. Marks for each Internal Test:	30
2	No. of Assignments:	03	Max. Marks for each Assignment:	05
3	No. of Quizzes:	03	Max. Marks for each Quiz Test:	05

Duration of Internal Test: 90 Minutes

VASAVI COLLEGE OF ENGINEERING (Autonomous)

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DEPARTMENT OF HUMANITIES AND SOCIAL SCIENCES

TECHNICAL WRITING AND PROFESSIONAL PRESENTATIONS

(Open Elective-II)

SYLLABUS FOR B.E. - IV Semester

Instruction : 3 Hours	SEE : 60	Course code : U23OE020EH
Credits : 3	CIE : 40	Duration of SEE : 3 Hours

<p>COURSE OBJECTIVES The course will enable the learners to:</p> <ol style="list-style-type: none">1. Understand the principles and mechanics of technical writing for students of engineering.2. Identify different kinds of business correspondences and the dos and don'ts for each of them.3. Make effective presentations as part of today's workplace demands.4. Recognize the need for Video and Written CVs with focus on specific elements.5. Comprehend skills associated with technical writing and understand different papers ranging from process description and feasibility reports to research projects, project proposals, and SOPs	<p>COURSE OUTCOMES At the end of the course the learners will be able to: -</p> <ol style="list-style-type: none">1. Write effective reports.2. Articulate business correspondences based on need.3. Make persuasive presentations.4. Design their videos CVs.5. Write papers ranging from process description and feasibility reports to research projects, project proposals, and statement of purpose
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UNIT 1: FORMAL & INFORMAL TECHNICAL REPORTS

- 1.1 Informal Report Formats
- 1.2 Project and Research Reports
- 1.3 Formal Report Components, Feasibility Reports, Evaluation reports
- 1.4 Analytical and Informational reports
- 1.5 Executive summaries.

UNIT 2: BUSINESS CORRESPONDENCE

- 2.1 Electronic communication
- 2.2 Effective emails
- 2.3 Instant and text messaging guidelines

UNIT 3: PROFESSIONAL PRESENTATIONS

- 3.1 Paper presentations & Poster presentations
- 3.2 PowerPoint presentations
- 3.3 Storyboard writing

UNIT 4: RESUME & CVs

- 4.1 Technical Resume
- 4.2 Cover letter, resume format
- 4.3 Video CVs

UNIT 5: WRITING PROPOSALS & SOPs

- 5.1 Types of proposals
- 5.2 Request for proposals
- 5.3 Stating your objective.

METHODOLOGY

- Case Studies
- Demonstration
- Presentations
- Expert lectures
- Writing and Audio-visual lessons

ASSESSMENTS

- Online assignments
- Individual and Group

LEARNING RESOURCES

learn.talentsprint.com

1. Read Me First!: A Style Guide for the Computer Industry by Sun Technical Publications
2. Eats, Shoots and Leaves Paperback – 18 February 2010 by Lynne Truss
3. Don't Make Me Think, Revisited: A Common Sense Approach to Web & Mobile Usability | Third Edition | By Pearson Paperback –
4. The Design of Everyday Things: Revised and Expanded Edition Paperback – Illustrated, 5 November 2013 by Don Norman (Author)

The break-up of CIE : Internal Tests + Assignments + Quizzes

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|--------------------------|---|--------------------------------|-----------------------------------|---|---------------------------------|
| 1. No. of Internal Tests | : | <input type="text" value="2"/> | Max. Marks for each Internal Test | : | <input type="text" value="30"/> |
| 2. No. of Assignments | : | <input type="text" value="3"/> | Max. Marks for each Assignment | : | <input type="text" value="5"/> |
| 3. No. of Quizzes | : | <input type="text" value="3"/> | Max. Marks for each Quiz Test | : | <input type="text" value="5"/> |

With effect from the Academic Year 2024-25

Duration of Internal Test: 90 Minutes

VASAVI COLLEGE OF ENGINEERING (Autonomous)

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IBRAHIMBAGH, HYDERABAD – 500 031

DEPARTMENT OF HUMANITIES AND SOCIAL SCIENCES

CRITICAL THINKING

(Open Elective-II)

SYLLABUS FOR B.E. - IV Semester

Instruction : 3 Hours	SEE : 60	Course code : U23OE430EH
Credits : 3	CIE : 40	Duration of SEE : 3 Hours

<p>COURSE OBJECTIVES The course will enable the learners to:</p> <ol style="list-style-type: none">1. Identify the core skills associated with critical thinking.2. Comprehend the various techniques of critical thinking3. Evaluate data and draw insights from it to make the right decisions4. Understand where to look for bias and assumptions in problem5. Understand structure, standards and ethics of critical writing	<p>COURSE OUTCOMES At the end of the course the learners will be able to: -</p> <ol style="list-style-type: none">1. Analyse and compare techniques for comparing alternate solutions2. Demonstrate the difference between deductive and inductive reasoning and construct logically sound arguments3. Check for accuracy of data and use it as a tool for problem solving4. Evaluate, identify and distinguish between relevant and irrelevant information to formulate a thesis or hypothesis.5. Employ evidence and information effectively
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UNIT 1: COMPONENTS OF CRITICAL THINKING

- 1.1 Applying Reason
- 1.2 Open Mindedness
- 1.3 Analysis
- 1.4 Logic

UNIT 2: NON-LINEAR THINKING

- 2.1 Step out of your Comfort Zone
- 2.2 Don't Jump to Conclusions
- 2.3 Expect and Initiate Change

2.4 Being Ready to Adapt

UNIT 3: LOGICAL THINKING

- 3.1 Ask the Right Questions
- 3.2 Organize Data
- 3.3 Evaluate Information
- 3.4 Draw Conclusions

UNIT 4: INFER MEANING FROM INFORMATIVE TEXTS

- 4.1 Making Assumptions
- 4.2 Watch out for Bias
- 4.3 Ask Clarifying Questions
- 4.4 SWOT Analysis

UNIT 5: PROBLEM SOLVING

- 5.1 Introduction to Problem Solving - Changing Your Perspective
- 5.2 Limitations of Point of View
- 5.3 Considering others viewpoints

METHODOLOGY

- Case Studies
- Demonstration
- Presentations
- Expert lectures
- Writing and Audio-visual lessons

ASSESSMENTS

- Online assignments
- Individual and Group

LEARNING RESOURCES

[learn.talentsprint.com](https://www.learn.talentsprint.com)

1. Calling Bullshit: The Art of Skepticism in a Data-Driven World. by Carl Bergstrom & Jevin West. ...
2. Thinking, Fast and Slow. by Daniel Kahneman. ...
3. Factfulness: Ten Reasons We're Wrong About The World — And Why Things Are Better Than You Think. ...
4. Box Thinking: The Surprising Truth About Success. ...

The break-up of CIE : Internal Tests + Assignments + Quizzes

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| 2. No. of Assignments | : | <input type="text" value="3"/> | Max. Marks for each Assignment | : | <input type="text" value="5"/> |
| 3. No. of Quizzes | : | <input type="text" value="3"/> | Max. Marks for each Quiz Test | : | <input type="text" value="5"/> |

Duration of Internal Test: 90 Minutes

With effect from the Academic Year 2024-25

VASAVI COLLEGE OF ENGINEERING (Autonomous)

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DEPARTMENT OF MATHEMATICS

NUMERICAL METHODS

(Open Elective-II)

SYLLABUS FOR B.E.IV-SEMESTER

L:T:P(Hrs/week):3:0:0	SEE Marks:60	Course Code:U23OE410MA
Credits :03	CIE Marks:40	Duration of SEE:03Hours

COURSE OBJECTIVES	COURSE OUTCOMES
<i>The course will enable the students to:</i>	<i>At the end of the course students will be able to:</i>
<ol style="list-style-type: none">1. Study the various numerical methods to solve Algebraic and Transcendental equations.2. Understand the methods to solve linear system of equations.3. Understand the numerical methods in interpolation and extrapolation.4. Understand the numerical methods in interpolation using central differences.5. Understand the numerical methods in solving ordinary differential equations.	<ol style="list-style-type: none">1. Apply the numerical methods to solve Algebraic and Transcendental equations which cannot be solved by traditional algebraic methods2. Solve the linear system of equations using direct and iteration methods.3. Use the various numerical methods in interpolation and extrapolation.4. Use the various numerical methods in interpolation using central differences.5. Find the numerical solutions of ordinary differential equations.

Unit – I: (8 Hours)

Solution of Algebraic and Transcendental equations:

Intermediate value property of equations - Solution of Algebraic and Transcendental equations: Bisection method - Newton-Raphson method - Regula-Falsi method.

Unit – II: (8 Hours)

Solution of linear system of equations:

Direct methods - Gauss elimination method - Factorization method - Iterative methods: Jacobi's method – Gauss-Seidel method - Ill-conditioned system of equations.

Unit – III: (8 Hours)

Numerical differences-I

Introduction to finite differences - Interpolation- Newton’s Forward and Backward Interpolation Formulae - Interpolation with unequal intervals - Lagrange’s Interpolation Formula - Divided differences - Newton’s divided difference formula.

Unit – IV: (8 Hours)

Numerical differences-II

Central differences interpolation - Gauss’s forwards and backward difference formulae - Stirling’s formula - Bessel’s formula.

Unit – V: (8 Hours)

Numerical Solutions of Ordinary Differential Equations

Numerical Solutions of Ordinary Differential Equations: Taylor’s Series Method - Euler’s Method - Modified Euler’s Method – Runge-Kutta of 4th order (without proofs).

Text Books:

1. Numerical methods in engineering and science by B.S.Grewal, Khanna publishers
2. Advanced Engineering Mathematics by R.K.Jain & S.R.K.Iyengar, Narosa publishing house.

Reference Books:

1. Numerical Analysis by S.S.Sastry, PHI Ltd.

Online Resources:

- 1 https://onlinecourses.swayam2.ac.in/cec24_ma19/preview

The break-up of CIE : Internal Tests + Assignments + Quizzes

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| 3. No. of Quizzes | : | <input type="text" value="3"/> | Max. Marks for each Quiz Test | : | <input type="text" value="5"/> |

Duration of Internal Test: 90 Minutes

With effect from the Academic Year 2024-25

VASAVI COLLEGE OF ENGINEERING (Autonomous)

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DEPARTMENT OF MATHEMATICS

ALGEBRAIC STRUCTURES

(Open Elective-II)

SYLLABUS FOR B.E.IV-SEMESTER

L:T:P(Hrs/week):3:0:0	SEE Marks:60	Course Code:U23OE420MA
Credits :03	CIE Marks:40	Duration of SEE:03Hours

COURSE OBJECTIVES	COURSE OUTCOMES
<i>The course will enable the students to:</i>	<i>At the end of the course students will be able to:</i>
<ol style="list-style-type: none">Study the concept of Groups, Finite Groups, Subgroups, Cyclic Groups and their properties.Understand Isomorphism – Automorphisms of groups and their properties.Learn group Homomorphisms and related concepts.Acquire knowledge of Rings, Integral domains and Fields, External and Internal direct products.Identify Ring Homomorphisms, properties and polynomial rings	<ol style="list-style-type: none">Solve the problems on Groups and will be equipped to apply them in applications like robotics, computer vision, computer graphics and medical image analysisImplement the concepts of automorphism in developing encoding and decoding tools of CryptographyApply homomorphisms in the study of formal languages, automata theory, and compiler design.Use the knowledge of Rings, Integral domains and Fields in coding theory.Compute the programming of modern computer algebra algorithms using ring homomorphisms.

Unit-I:

Groups (8 classes)

Groups – Definition, Elementary properties of Groups, Finite Groups, Subgroups, Cyclic Groups – Properties of Cyclic Groups, Classification of Subgroups of Cyclic Group.

Unit-II:

Group Isomorphisms (8 classes)

Isomorphism – Definition, Properties, Automorphisms, Cosets and Lagrange’s theorem-properties of cosets, Lagrange’s theorem.

Unit-III:

Group Homomorphisms (08 classes)

External Direct Products - Definition, Properties, Factor Groups and Normal Subgroups, Internal Direct Products, Group Homomorphisms – Definition, Properties.

Unit-IV:

Rings (8 classes)

Rings, Properties of Rings, Subrings, Integral Domains and Fields Ring Homomorphisms and Ideals, Prime and Maximal Ideals.

Unit-V:

Ring Homomorphisms (8 classes)

Properties of Ring Homomorphisms, Polynomials - Polynomial Rings, the Division Algorithm.

Text Books:

1. Contemporary Abstract Algebra, Joseph A. Gallian, CRC Press
2. A First Course in Abstract Algebra, John B. Fraleigh, Pearson Education Limited

Reference Books:

1. Topics in Algebra, I. N. Herstein, John Wiley & Sons
2. Basic Abstract Algebra, P. B. Bhattacharya, S. K. Jain, S. R. Nagpaul, Cambridge University Press
3. Abstract Algebra, D. S. Dummit, R. M. Foote, John Wiley & Sons, Inc.

Online Resources:

1. <https://ocw.mit.edu/>
2. <http://www.nptel.ac.in/course.php>
3. <https://www.coursera.org/in>

The break-up of CIE : Internal Tests + Assignments + Quizzes

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|--------------------------|---|--------------------------------|-----------------------------------|---|---------------------------------|
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| 2. No. of Assignments | : | <input type="text" value="3"/> | Max. Marks for each Assignment | : | <input type="text" value="5"/> |
| 3. No. of Quizzes | : | <input type="text" value="3"/> | Max. Marks for each Quiz Test | : | <input type="text" value="5"/> |

Duration of Internal Test: 90 Minutes

With effect from the Academic Year 2024-25
VASAVI COLLEGE OF ENGINEERING (Autonomous)

ACCREDITED BY NAAC WITH 'A++' GRADE
IBRAHIMBAGH, HYDERABAD – 500 031

DEPARTMENT OF HUMANITIES & SOCIAL SCIENCES

Skill Development Course- III (Aptitude)

SYLLABUS FOR B. E -IV SEMESTER

L:T:P (Hrs/Week):1:0:0	SEE Marks: 40	Course Code: U23BS430MA
Credits: 1	CIE Marks : 30	Duration of SEE : 2 Hours

<p>COURSE OBJECTIVES The course will enable the learners to:</p> <ol style="list-style-type: none">1. Students will be trained to enhance their employability skills.2. Students will be introduced to higher order thinking and problem solving skills in the following areas - Arithmetic Ability, Numerical Ability and General Reasoning.3. Students will be trained to work systematically with speed and accuracy while problem solving.4. Students will be trained to apply concepts like percentages and averages to solve complex problems.5. Students will be trained to use effective methods like elimination of options and shortcuts to solve problem accurately.	<p>COURSE OUTCOMES At the end of the course the learners will be able to: -</p> <ol style="list-style-type: none">1. Solve questions in the mentioned areas using shortcuts and smart methods.2. Understand the fundamentals concept of Aptitude skills.3. Perform calculations with speed and accuracy.4. Solve complex problems using basic concepts.5. Use shortcuts with ease for effective problem solving.
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UNIT 1

QUANTITATIVE APTITUDE- ARITHMETIC ABILITY ADVANCED -1

1.1 Time speed and distance

1.2 Boats and Streams

1.3 Problems on trains

UNIT 2

REASONING ABILITY- LOGICAL REASONING

2.1 Seating Arrangements- Linear; Circular; Complex

2.2 Venn diagrams

2.3 Syllogism

2.4 Cubes & Cuboids

2.5 Dices

UNIT 3

REASONING ABILITY- NON VERBAL REASONING

3.1 Figure Series

3.2 Directions

3.3 Clocks

3.4 Calendars

UNIT 4

QUANTITATIVE APTITUDE- ARITHMETIC ABILITY ADVANCED -2

4.1 Mensuration Part -1

4.2 Mensuration Part -2

4.3 Logarithms

UNIT 5

QUANTITATIVE APTITUDE- ENGINEERING MATHEMATICS

5.1 Permutations and combinations

5.2 Probability

Learning Resources :

Prescribed textbook for theory:

1. Quantitative Aptitude S.CHAND by RS AGARWAL
2. A Modern Approach to Verbal & Non-Verbal Reasoning S.CHAND by Dr. R S Aggarwal

Suggested Reading

1. Learn.talentsprint.com/References Courses
2. Quantitative Aptitude Disha Publications
3. LOGICAL Reasoning Disha Publications

The break-up of CIE: Internal Tests + Assignments + Quizzes

1	No. of Internal tests	:	2	Max. Marks	:	20
2	No. of assignments	:	2	Max. Marks	:	5
3	No. of Quizzes	:	2	Max. Marks	:	5

Duration of Internal Tests : 90 Minutes

With effect from the Academic Year 2024-25

VASAVI COLLEGE OF ENGINEERING(Autonomous)

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Department of Computer Science & Engineering

Skill Development Course-IV (Technical Skills-II)

Problem Solving through Data Structures

SYLLABUS FOR B.E. IV-SEMESTER

L:T:P (Hrs./week):1:0:0	SEE Marks : 40	Course Code: UII23PE410CS
Credits : 1	CIE Marks : 30	Duration of SEE : 2 Hours

COURSE OBJECTIVES	COURSE OUTCOMES <i>On completion of the course, students will be able to</i>
<ol style="list-style-type: none">1. Understand the Nonlinear data structures and their applications.2. Prepare the students for the contests relative to the concepts learnt.3. Build confidence in coding using Non Linear Data structures4. Leverage the Industry Standards of the DBMS concepts	<ol style="list-style-type: none">1. Learn non-linear data structures with various applications that are essential for solving problems which involve complex relationships, efficient searching, and hierarchical organization.2. Solve scenario based problems using Tree Data structures3. Learn and apply greedy algorithms for efficient solutions to complex problems.4. Learn and apply database concepts for designing efficient, reliable, and well-structured databases that meet the needs of modern applications.

Problem Solving through Non-Linear Data structures – Trees I

Problem solving approaches using Non-linear data structures, Coding problems on the height of a binary tree, Size of a binary tree, Tree order traversals, Problem Solving on Binary Trees, Examples, Practice problems.

Problem Solving through Non-Linear Data structures – Trees II

Time comparison and analysis on Binary Search Trees & Coding problems,

Search/probe sequence validation, Significance of height balancing the tree, Examples, Practice problems.

Problem Solving implementing Algorithms - Greedy Methods II

Algorithmic Thinking, Selection as Greedy Strategy, Heaps Min and Max, Priority Queues, Greedy Coin change solution, Examples, Practice problems.

Problem Solving implementing Algorithms - Greedy Methods II

Fractional Knapsack, Sequencing jobs with deadlines, Activity selection, Examples, Practice problems.

Problem Solving using DBMS I

Industry Standards of leveraging DBMS concepts: SQL Queries, Entity Relationship Models, Question, and answers.

Problem Solving using DBMS II

Industry Standards of leveraging DBMS concepts: Query Optimization, Transactions & Concurrency, Normalization, case studies, Question and answers

The break-up of CIE: Internal Tests + Assignments + Quizzes

1	No. of Internal Tests	:	1	Max. Marks for each Internal Test	:	20
2	No. Quizzes	:	1	Max. Marks for each Quiz	:	10

Duration of Internal Tests : 1 Hour 30 Minutes

VASAVI COLLEGE OF ENGINEERING(Autonomous)

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Department of Computer Science & Engineering

DATABASE MANAGEMENT SYSTEMS LAB
SYLLABUS FOR B.E. IV-SEMESTER

L:T:P (Hrs./week):0:0:2	SEE Marks:50	Course Code:U1123PC421CS
Credits : 1	CIE Marks:30	Duration of SEE : 3 Hours

COURSE OBJECTIVES	COURSE OUTCOMES <i>On completion of the course, students will be able to</i>
1 Apply SQL commands on a database. 2 Develop an application using forms, reports and PL/SQL.	1 Design and implement a database schema. 2 Apply DDL, DML, DCL and TCL commands on a database. 3 Apply NO-SQL concepts for given database. 4 Implement PL/SQL programs for creating stored procedures, cursors & triggers. 5 Design and implement an application using forms and reports.

Programming Exercise:

I. SQL

1. Creation of database tables without constraints.
2. Creating tables using combination of constraints.
3. Usage of Stored Functions.
4. Exercising all types of Joins.
5. Exercising complex Queries.
6. Experiments on No-SQL.

II. PL/SQL

1. Demonstration of Blocks, Cursors, functions and Packages.
2. Demonstrate Exception Handling.
3. Usage of Triggers to perform operation on Single and Multiple Tables.
4. PL/SQL Procedures for data validation.

Learning Resources:

1. Ivan Bayross, SQL, PL/SQL, The Programming Language of Oracle,4th Edition, PBP Publications.
2. Sadalage, P. & Fowler, NoSQL Distilled: A Brief Guide to the Emerging World of Polyglot Persistence, Wiley Publications,1st Edition ,2019.
3. Rick F Van der Lans, Introduction to SQL, 4th Edition (2007), Pearson Education.
4. Benjamin Rosenzweig Elena Silvestrova, Oracle PL/SQL by Example, 3rdEdition(2004), Person Education.
5. Albert Lulushi, Oracle Forms Developer's Handbook, 1st Edition (2006), Pearson Education.
6. <https://www.lynda.com/Access-tutorials/Welcome/195854/373426-4.html>

No. of Internal Tests:	01	Max. Marks for Internal Test:	12
Marks for day-to-day laboratory class work			18
Duration of Internal Test: 2 Hours			

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Department of Computer Science & Engineering

OPERATING SYSTEMS LAB
SYLLABUS FOR B.E. IV-SEMESTER

L:T:P (Hrs./week):0:0:2	SEE Marks:50	Course Code:U1123PC431CS
Credits : 1	CIE Marks:30	Duration of SEE : 3 Hours

COURSE OBJECTIVES	COURSE OUTCOMES <i>On completion of the course, students will be able to</i>
1 Apply system calls for process management and file management 2 Implement techniques related to CPU Scheduling, Main memory management, Process synchronization and deadlock avoidance & detection	1 Implement operations on Files and Process by using system calls 2 Implement CPU Scheduling algorithms 3 Implement Page Replacement techniques 4 Design and implement solutions for Inter-Process Communication 5 Implement Kernel module programs

Programming Exercise:

1. Building & Booting of Operating system, Disk partitioning and Dual boot of OS
2. Write shell programs to implement a given task.
3. Implement system calls for File system management.
4. Implement system calls for Process management.
5. Write C programs to implement CPU scheduling algorithms (FCSF, SJF, Priority, RR, Multi level)
6. Write C programs to implement Page Replacement algorithms.
7. Implement Inter-process communication using
 - i. Pipes (by using pipe system call)

- ii. Message Queues (by using msgget, msgsnd, msgrcv system calls)
- iii. Shared Memory (by using shmget, shmat, shmdt system calls)
8. Implement Process Synchronization for Bounded buffer, Readers-Writers and Dining philosophers' problems using Semaphores. (by using semget, semop system calls)
9. Study pthreads and implement a program which shows the performance improvement in using threads as compared with process.(Examples like Matrix Multiplication, Hyper quicksort, Merge sort, Traveling Sales Person problem)
10. Write a Linux Kernel Module for Task Information extraction.
11. Write a Linux Kernel Module for Listing Tasks.

Learning Resources:

1. Kernighan and Pike, UNIX Programming Environment, PHI/Pearson Education
2. U. Vahalia, UNIX Internals: The New Frontiers, Pearson Education Inc.2003.
3. Abraham Silberschatz, Peter B. Galvin, Greg Gagne, *Operating System Concepts*, 10th Edition (2018), Wiley India.
4. Andrew S. Tanenbaum, *Modern Operating Systems*, 2nd Edition (2001), Pearson Education, Asia.
5. Dhananjay, Dhamdhere.M, *Operating System-concept based approach*, 3rd edition (2009), Tata McGraw Hill, Asia
6. Robert Love: *Linux Kernel Development*, (2004)Pearson Education
7. Richard Stevens, Stephen Rago, *Advanced Programming in the UNIX Environment*, 3rd Edition(2013), Pearson Education
8. <http://web.stanford.edu/~ouster/cgi-bin/cs140-spring19/index.php>
9. <https://nptel.ac.in/courses/106106144/>

No. of Internal Tests:	01	Max. Marks for Internal Test:	12
Marks for day-to-day laboratory class work			18
Duration of Internal Test: 2 Hours			

With effect from the Academic Year 2024-25
VASAVI COLLEGE OF ENGINEERING (Autonomous)

ACCREDITED BY NAAC WITH 'A++' GRADE
IBRAHIMBAGH, HYDERABAD – 500 031

Department of Computer Science & Engineering

DESIGN & ANALYSIS OF ALGORITHMS LAB
SYLLABUS FOR B.E. IV-SEMESTER

L:T:P(Hrs./week):0:0:2	SEE Marks : 50	Course Code:U1123PC441CS
Credits : 1	CIE Marks : 30	Duration of SEE : 3 Hours

COURSE OBJECTIVES	COURSE OUTCOMES <i>On completion of the course, students will be able to</i>
1 Implement solutions for the given problems using divide and conquer	1 Implement searching, sorting and hashing using basic data structures.
2 Implement solutions for the given problems using greedy and dynamic programming	2 Apply divide and conquer strategy to implement algorithm for a given problem.
3 Implement solutions for the given problems using backtracking and branch and bound.	3 Implement an algorithm for a given problem using Greedy design strategy
	4 Apply dynamic programming to implement algorithms for a set of problems.
	5 Implement algorithms for set of problems using backtracking and branch and bound.

Programming Exercise:

1. Implementation of Merge Sort, Quick Sort, Heap Sort, Binary Search and Hashing.
2. Implementation of Traversal on Graphs.
3. Implementation of Traversal on Trees and DAG.
4. Implement Single source shortest path algorithm.
5. Implement Minimum cost spanning tree algorithm.
6. Implement fractional Knapsack algorithm.
7. Implement Optimal merge patterns -Huffman encoding algorithm.

Learning Resources:

1. Balasubramanian: A textbook of English phonetics for Indian students, Macmillan, 2008.
2. Priyadarshini Patnaik: Group discussion and interviews, Cambridge University Press India private limited 2011.
3. Daniel Jones: Cambridge English Pronouncing Dictionary - A Definitive guide to contemporary English Pronunciation.