# LECTURE PLAN



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| **Institute/Department** | UNIVERSITY INSTITUTE OF ENGINEERING (UIE) | **Program** | **Bachelor of Engineering-Automobile Engineering(AE201)** |
| **Master Subject Coordinator Name:** | Prabhat Ranjan Singh | **Master Subject Coordinator E-Code**: | **E13690** |
| **Course Name** | Aptitude | **Course Code** | **21TDT-252** |

| Lecture | Tutorial | Practical | Self Study | Credit | Subject Type |
|---|---|---|---|---|---|
| 0 | 2 | 0 | 0 | 2.0 | T |

| Course Type | Course Category | Mode of Assessment | Mode of Delivery |
|---|---|---|---|
| Employability Enhancement Course | Graded (GR) | Theory Examination (ET) | Theory (TH) |

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| Mission of the Department | MD1. To train professional engineers with strong analytical, modelling, designing, experimental and team work skills.<br>MD2. To provide innovative teaching practices, through excellent laboratory infrastructure and exposure to recent trends in the automotive industry.<br>MD3. To ensure that students are molded into competent automotive engineers to meet the growing challenges of the future.<br>MD4. To provide industry oriented skills and guidance to students for conducting industry collaborated research and educating them with futuristic skills.<br>MD5. Inculcate societal responsibility and ethical values to address the concerns relating to the environment and overall development. |
| Vision of the Department | To be a Centre of Excellence in Automobile Engineering through research in emerging fields for providing globally competent Engineers equipped with the technology of the future. |

| Program Educational Objectives(PEOs) | |
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| PEO1 | Automobile Engineering Graduates will contribute at local, regional and global level by solving complex engineering problems in the field of Automobile and Mechanical related industries. |
| PEO2 | To prepare graduates for successful career in the field of Automobile Engineering or a related field utilizing his/her education and contribute as an excellent professional and to encourage the spirit of entrepreneurship. |
| PEO3 | Graduates of Automobile Engineering will be able to adapt futuristic technology and innovative skills applicable for dynamic industrial competency to achieve sustainable development goals for life-long learning and career enhancement. |

| Program Specific OutComes(PSOs) | |
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| PSO1 | 1. Ability to apply the concepts of alternative advanced fuels, emission norms and manufacturing technologies for design, development, analysis and maintenance of mechanical systems & processes used in automotive sector. |
| PSO2 | 2. Ability to work as a professional and/or as an entrepreneur by applying engineering principles and management practices |

| Program OutComes(POs) | |
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| PO1 | Engineering Knowledge: Apply knowledge of mathematics, science and engineering fundamentals and Production and Industrial Engineering specialization to the solution of complex Production and Industrial Engineering problems. |
| PO2 | Problem Analysis: Identify, formulate, research literature and analyze complex Production and Industrial Engineering problems reaching substantiated conclusions using first principles of mathematics, natural sciences and engineering sciences. |
| PO3 | Design/ Development of Solutions: Design solutions for complex Engineering problems and design system components or processes that meet specified needs with appropriate consideration for public health and safety, cultural, societal and environmental considerations. |
| PO4 | Conduct investigations of complex Engineering problems: Use research-based knowledge and research methods including analysis, interpretation of data and synthesis of information to provide valid conclusions. |
| PO5 | Modern Tool Usage: Create, select, and apply appropriate techniques, resources, and modern engineering and IT tools including prediction and modeling to complex engineering activities with an understanding of the limitations. |
| PO6 | The Engineer and Society: Apply contextual knowledge to assess societal, health, safety, legal and cultural issues and the consequent responsibilities relevant to professional engineering practice. |

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| PO7 | Environment and Sustainability: Understand the impact of the professional engineering solutions in societal and environmental contexts, and demonstrate the knowledge of, and need for sustainable development. |
| PO8 | Ethics: Apply ethical principles and commit to professional ethics and responsibilities and norms of engineering practice. |
| PO9 | Individual and Team Work: Function effectively as an individual, and as a member or leader in diverse teams and in multidisciplinary settings. |
| PO10 | Communication: Communicate effectively on complex Engineering activities with the engineering community and with society at large, such as being able to comprehend and write effective reports and design documentation, make effective presentations and give and receive clear instructions. |
| PO11 | Project Management and Finance: Demonstrate knowledge and understanding of Engineering and management principles and apply these to one's own work, as a member and leader in a team, to manage projects and in multidisciplinary environments. |
| PO12 | Life Long learning: Recognize the need for, and have the preparation and ability to engage in independent and life-long learning in the broadest context of technological change. |

**Text Books**

| Sr No | Title of the Book | Author Name | Volume/Edition | Publish Hours | Years |
|---|---|---|---|---|---|
| 1 | Building Blocks of Aptitude | Pardeep Bansal | 9th Edition | Chandigarh University | 2021 |

**Reference Books**

| Sr No | Title of the Book | Author Name | Volume/Edition | Publish Hours | Years |
|---|---|---|---|---|---|
| 1 | A Modern Approach to Verbal and Non Verbal Reasoning | Aggarwal R.S: | 11th Edition | S. Chand | 2018 |
| 2 | Quantitative Aptitude for Competitive Examinations | Guha Abhijit: | 8th Edition | Tata McGraw Hill Publication | 2018 |

**Course OutCome**

| SrNo | OutCome |
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| CO1 | To define, understand the basic knowledge of Numbers, percentage, time and work, speed and distance and explain the concepts of quantitative aptitude and logical reasoning. |
| CO2 | To apply the concept of Vedic Mathematics to find squares, cubes ,roots, the types of Simple and Compound annual growth to solve MCQs faster by the application of shortcut methods. |
| CO3 | To analyse the data in a bar graph, pie chart and tabular column and line graph and the combination of data given in the graphical format and infer the results |
| CO4 | To develop the ability to apply the concepts of time and work, time seed distance, probability and its applications in real life scenarios.. |
| CO5 | To evaluate the different charts of profit and loss and problems related to average, and extend the application shortcuts in such topics as simple interest, compound interest |

**Lecture Plan Preview-Theory**

| Unit No | LectureNo | ChapterName | Topic | Text/ Reference Books | Pedagogical Tool** | Mapped with CO Numer (s) |
|---|---|---|---|---|---|---|
| 1 | 1 | VEDIC MATHS | Multiplication with powers of 5,Multiplication with series of 1's,Multiplication with series of 9's,Multiplication of 2-digit & 3-digit numbers, Finding squares, Finding square roots, Finding Cube, Cube-roots | ,T-Building Blocks of Aptitude,R-Quantitative Aptitude for Comp | PPT | CO2 |

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| 1 | 2 | NUMBER SYSTEM, DIVISIBILITY RULE | Introduction to Topic(Recalling of basic concepts),Classification of numbers, Miscellaneous,Divisibility Rules (2 to 17),Divisibility Rules (2 to 17) | ,T-Building Blocks of Aptitude,R-Quantitative Aptitude for Comp | PPT | CO2 |
| 1 | 3 | PERCENTAGES 1 | Introduction to Topic(Recalling of basic concepts),Concept of percent change ,Successive Increase/Decrease & Population change concept . | ,T-Building Blocks of Aptitude,R-Quantitative Aptitude for Comp | PPT | CO2 |
| 1 | 4 | PERCENTAGES 2 | Price and consumption relationship ,Concept of Voting .Miscellaneous Questions, DI on Percentage | ,T-Building Blocks of Aptitude,R-Quantitative Aptitude for Comp | PPT | CO2 |
| 1 | 5 | PROFIT & LOSS 1 | Introduction to Topic(Recalling of basic concepts),Relation between CP, SP and MP & Calculation of CP/SP/MP/profit/loss/Discount percentage . | ,T-Building Blocks of Aptitude,R-Quantitative Aptitude for Comp | PPT | CO2 |
| 1 | 6 | PROFIT & LOSS 2 | Dishonest shopkeeper ,Successive discount problems ,DI on Profit and loss | ,T-Building Blocks of Aptitude,R-Quantitative Aptitude for Comp | PPT | CO2 |
| 1 | 7 | Simple Interest | Introduction to Topic(Recalling of basic concepts),Concept of simple Interest, Problems related to missing rate, principal and time . | ,T-Building Blocks of Aptitude,R-Quantitative Aptitude for Comp | PPT | CO2 |
| 1 | 8 | Compound Interest | Concept of compound interest, Concept of annually, half yearly, quarterly interest<br>Concept related to interest/amount being n times of Principal<br>Difference between SI and CI<br>DI on SI ,CI | ,T-Building Blocks of Aptitude,R-Quantitative Aptitude for Comp | PPT | CO2 |
| 1 | 25 | REVISION UNIT 1-1 | Vedic Maths (Finding squares ,square roots, Cubes, Cube roots, Multiplication of 2-digit & 3-digit numbers, | ,T-Building Blocks of Aptitude,R-Quantitative Aptitude for Comp | PPT | CO2 |
| 1 | 26 | REVISION UNIT 1-2 | Number System(Classification of numbers, Divisibility Rules (2 to 17) | ,T-Building Blocks of Aptitude,R-Quantitative Aptitude for Comp | PPT | CO2 |
| 2 | 9 | SYLLOGISM 1 | Introduction to Topic(Recalling of basic concepts),All + All based Venn Diagram ,<br>Some + Some based Venn Diagram ,All + Some based Venn Diagram<br>All+No/Some-No based Venn Diagram | ,T-Building Blocks of Aptitude,R-A Modern Approach to Verbal an | PPT | CO3 |
| 2 | 10 | SYLLOGISM 2 | Either-Or Based Venn Diagram , Possibility Based Venn Diagram ,Miscellaneous Questions | ,T-Building Blocks of Aptitude,R-A Modern Approach to Verbal an | PPT | CO3 |
| 2 | 11 | CODING DECODING 1 | Introduction to Topic(Recalling of basic concepts),Concept of EJOTY, Alphabetical order(i.e A =1, B=2 etc) concept ,Letter to Letter Coding . | ,T-Building Blocks of Aptitude,R-A Modern Approach to Verbal an | PPT | CO3 |
| 2 | 12 | CODING DECODING 2 | Letter to Number Coding ,Symbol based Coding ,Paragraph based Coding . | ,T-Building Blocks of Aptitude,R-A Modern Approach to Verbal an | PPT | CO3 |

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| 2 | 13 | DIRECTIONS | Introduction to Topic(Recalling of basic concepts),Concept of Cardinal directions Concept of Distance/Displacement ,Concept of Direction +Distance/Displacement ,Angle based (Clockwise and anti-clockwise rotation) Concept of Shadow Paragraph based questions. | ,T-Building Blocks of Aptitude,R-A Modern Approach to Verbal an | PPT | CO3 |
| 2 | 14 | DATA INTERPRETATION | Introduction to Topic(Recalling of basic concepts),Concept of Line graphs ,Concept of Tabular graph , Concept of Mixed graph | ,T-Building Blocks of Aptitude,R-A Modern Approach to Verbal an | PPT | CO3 |
| 2 | 27 | REVISION UNIT 2-1 | Syllogism, Coding- Decoding. | ,T-Building Blocks of Aptitude,R-Quantitative Aptitude for Comp | PPT | CO3 |
| 2 | 28 | REVISION UNIT 2-2 | Direction Sense, Data Interpretation. | ,T-Building Blocks of Aptitude,R-Quantitative Aptitude for Comp | PPT | CO3 |
| 3 | 15 | AVERAGE 1 | Introduction to Topic(Recalling of basic concepts),Practice of questions based on different types of numbers Concept of Inclusion ,Concept of Exclusion ,Concept of Replacement . | ,T-Building Blocks of Aptitude,R-Quantitative Aptitude for Comp | PPT | CO4 |
| 3 | 16 | AVERAGE 2 | Concept of weighted average ,practice of Word problems, D.I based on Average | ,T-Building Blocks of Aptitude,R-Quantitative Aptitude for Comp | PPT | CO4 |
| 3 | 17 | TIME & WORK 1 | Introduction to the topic, Relationship b/w Time, Work & Efficiency ,LCM approach ,Partial work Based Alternate days based questions, Efficiency based questions ,Concept of wages . | ,T-Building Blocks of Aptitude,R-Quantitative Aptitude for Comp | PPT | CO4 |
| 3 | 18 | TIME & WORK 2 | Chain Rule , Pipe & Cistern concept ,DI on Time & Work | ,T-Building Blocks of Aptitude,R-Quantitative Aptitude for Comp | PPT | CO4 |
| 3 | 19 | TIME, SPEED, DISTANCE 1 | Introduction to Topic(Recalling of basic concepts),Relation between time, speed and distance, Conversion of speed from m/s to km/h and vice versa, Concept of average speed , Concept of distance constant, Concept of Time Constant | ,T-Building Blocks of Aptitude,R-Quantitative Aptitude for Comp | PPT | CO4 |
| 3 | 20 | TIME, SPEED, DISTANCE 2 | Concept of relative speed ,Miscellaneous , questions Data sufficiency on Time, speed and distance | ,T-Building Blocks of Aptitude,R-Quantitative Aptitude for Comp | PPT | CO4 |
| 3 | 21 | PERMUTATION & COMBINATION 1 | Introduction to Topic(Recalling of basic concepts),Fundamental concept of counting ,Special cases of arrangement (cases with 0, multiple of a given number) | ,T-Building Blocks of Aptitude,R-Quantitative Aptitude for Comp | PPT | CO4 |
| 3 | 22 | PERMUTATION & COMBINATION 2 | Combination based Problems ,Relationship and difference between permutation and combination. | ,T-Building Blocks of Aptitude,R-Quantitative Aptitude for Comp | PPT | CO4 |

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| 3 | 23 | PROBABILITY 1 | Introduction to Topic(Recalling of basic concepts),Concept related to Coins ,Concept Related to Dice ,Concept related to Cards . | ,T-Building Blocks of Aptitude,R-Quantitative Aptitude for Comp | PPT | CO4 |
| 3 | 24 | PROBABILITY 2 | Concept related to box/bag containing items ,Miscellaneous cases and practice | ,T-Building Blocks of Aptitude,R-Quantitative Aptitude for Comp | PPT | CO4 |
| 3 | 29 | REVISION UNIT 3-1 | Average, Time and Work ,Time, Speed and Distance . | ,T-Building Blocks of Aptitude,R-Quantitative Aptitude for Comp | PPT | CO4 |
| 3 | 30 | REVISION UNIT 3-2 | Permutation and Combination, Probability | ,T-Building Blocks of Aptitude,R-Quantitative Aptitude for Comp | PPT | CO4 |

| Assessment Model | | | |
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| Sr No | Assessment Name | Exam Name | Max Marks |
| 1 | 20EU01 | External Theory | 60 |
| 2 | 20EU01 | Assignment | 10 |
| 3 | 20EU01 | Attendance Marks | 2 |
| 4 | 20EU01 | Mid-Semester Test-1 | 20 |
| 5 | 20EU01 | Quiz | 4 |
| 6 | 20EU01 | Surprise Test | 12 |
| 7 | 20EU01 | Mid-Semester Test-2 | 20 |