

## Lesson Plan (2026-2027)

**Name :** Narender Rana  
**Discipline :** Common for all branches  
**Year :** 1<sup>st</sup> Sem  
**Subject :** Applied Mathematics I  
**Code :** 250012  
**Duration :** 03/08/2026 to 23/11/2026  
**Work Load :** 4 Lectures per week

| Lecture No. | Theory                                                                                                                   |
|-------------|--------------------------------------------------------------------------------------------------------------------------|
|             | Topics                                                                                                                   |
| 1           | Complex numbers: definition of complex number, real and imaginary parts of a complex number.(L1)                         |
| 2           | Complex numbers: definition of complex number, real and imaginary parts of a complex number.(L2)                         |
| 3           | Addition, subtraction, multiplication and division of complex numbers.(L1)                                               |
| 4           | Addition, subtraction, multiplication and division of complex numbers.(L2)                                               |
| 5           | Conjugate of a complex number, modulus and amplitude of complex numbers.                                                 |
| 6           | Polar and Cartesian form and their inter conversion.                                                                     |
| 7           | Logarithms and its basic properties.(L1)                                                                                 |
| 8           | Logarithms and its basic properties.(L2)                                                                                 |
| 9           | Logarithms and its basic properties.(L3)                                                                                 |
| 10          | Permutation and value of ${}^n P_r$ with solved examples.                                                                |
| 11          | Combination and value of ${}^n C_r$ with solved examples.                                                                |
| 12          | Binomial theorem for positive integral index with simple problems.(L1)                                                   |
| 13          | Binomial theorem for positive integral index with simple problems.(L2)                                                   |
| 14          | General term from binomial expansion and related problems.                                                               |
| 15          | Binomial theorem for any index with simple problems                                                                      |
| 16          | Definition of Matrix and its types with examples .                                                                       |
| 17          | Addition and subtraction of Matrices. (upto 2 <sup>nd</sup> order).                                                      |
| 18          | Multiplication of Matrices (upto 2 <sup>nd</sup> order).                                                                 |
| 19          | Determinants: Evaluation of determinants (up to 2 orders).(L1)                                                           |
| 20          | Determinants: Evaluation of determinants (up to 2 orders).(L2)                                                           |
| 21          | Solution of equations (up to 2 unknowns) by Cramer's Rule.                                                               |
| 22          | Concept of angle: measurement of angle in degrees, grades, radians.                                                      |
| 23          | Conversions of angles.                                                                                                   |
| 24          | T-Ratios of standard angle (0°, 30°, 45° etc.) and fundamental Identities.                                               |
| 25          | Allied angles (without proof) Sum, Difference formulae and their applications (without proof). (L-1)                     |
| 26          | Allied angles (without proof) Sum, Difference formulae and their applications (without proof). (L-2)                     |
| 27          | Product formulae (Transformation of product to sum, difference and vice versa). (L1)                                     |
| 28          | Product formulae (Transformation of product to sum, difference and vice versa). (L2)                                     |
| 29          | Applications of Trigonometric terms in engineering problems such as to find an angle of elevation, height, distance etc. |
| 30          | Applications of Trigonometric terms in engineering problems.(L1)                                                         |

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|----|----------------------------------------------------------------------------------------------------------------------------------|
| 31 | Applications of Trigonometric terms in engineering problems.(L2)                                                                 |
| 32 | Distance Formula, Mid Point formula, centroid of triangle.                                                                       |
| 33 | Straight line: Slope of a line, equation of straight line in various standards forms (without proof).(L1)                        |
| 34 | Straight line: Slope of a line, equation of straight line in various standards forms (without proof).(L2)                        |
| 35 | Examples based on slope intercept form, intercept form and one-point form of straight line.                                      |
| 36 | Examples based on two-point form, normal form and general form of straight line(L1).                                             |
| 37 | Examples based on two-point form, normal form and general form of straight line(L2).                                             |
| 38 | Angle between two straight lines.                                                                                                |
| 39 | Intersection of two straight lines, concurrency of lines.                                                                        |
| 40 | Parallel and perpendicular lines, perpendicular distance formula.                                                                |
| 41 | Conversion of general form of equation to the various forms.(L1)                                                                 |
| 42 | Conversion of general form of equation to the various forms.(L2)                                                                 |
| 43 | Circle: General equation of a circle and identification of centre and radius of circle(L1).                                      |
| 44 | Circle: General equation of a circle and identification of centre and radius of circle(L2).                                      |
| 45 | To find the equation of a circle when centre and radius are given and when coordinates of end points of a diameter are given.    |
| 46 | To find the equation of a circle when centre and radius are given and when coordinates of end points of a diameter are given(L1) |
| 47 | To find the equation of a circle when centre and radius are given and when coordinates of end points of a diameter are given(L2) |
| 48 | To find the equation of a circle when three points lying on its.                                                                 |
| 49 | Theoretical introduction of MATLAB (L1).                                                                                         |
| 50 | Theoretical introduction of MATLAB(L2).                                                                                          |
| 51 | Theoretical introduction of MATLAB(L3).                                                                                          |
| 52 | MATLAB or Scilab as simple calculator (addition and subtraction values).                                                         |

**Note:** There will be Class Tests; Assignments work, Sessional Tests; Quizzes etc. will be given as per Academic Calendar (2026-27) of Even semesters.

HP  
PAC  
Member I  
(Sh Navendu Kana)

PAC  
Member II  
(Smt Sonu)

PCA  
Member III  
(Smt Jyoti Gupta)