



GOVERNMENT POLYTECHNIC KANDHAMAL

LESSON PLAN FOR MATHEMATICS-I

(Course Code-TH 3)

WINTER-2025

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| DEPARTMANT: Mathematics & Science | SEMESTER:1ST | NAME OF THE FACULTY TEACHING: Sri Nirakara Bag, Lecturer stage-I, Mathematics |
| SUBJECT: Engg. Mathematics (TH 3) | TOTAL PERIOD: 60 | CREDIT: 4 |
| DURATION OF END SEM EXAM: 3 Hours | PERIOD PER WEEK: 4 | IA: 30 MARKS END SEM EXAM: 70 MARKS |

Semester From Date: 06-08-2025 to Date: 14-12-2025

LESSON PLAN AND COURSE STRUCTURE

| Week | Day | Topic to be covered |
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| UNIT I – Trigonometry | | |
| Week 1 | Day 1 | Introduction to Trigonometry and Concept of Angle |
| | Day 2 | Degrees, Radians, Grades & Their Conversions |
| | Day 3 | T-Ratios of Allied Angles (without proof) |
| | Day 4 | Sum and Difference Formulas and Their Applications |
| Week 2 | Day 5 | Product-to-Sum and Sum-to-Product Formulas |
| | Day 6 | Transformation of Products |
| | Day 7 | T-Ratios of Multiple Angles (2A, 3A) |
| | Day 8 | T-Ratios of Sub-Multiple Angles (A/2) |
| Week 3 | Day 9 | Graphs of sin x and cos x |
| | Day 10 | Graphs of tan x and e^x |
| | Day 11 | Practice: Graphs & Identities |
| | Day 12 | Unit I Revision & Test |
| UNIT II – Differential Calculus | | |
| Week 4 | Day 13 | Definition of Function |
| | Day 14 | Concept of Limit |
| | Day 15 | Standard Limits $\lim_{x \rightarrow a} \frac{x^n - a^n}{x - a}$ $\lim_{x \rightarrow 0} \frac{\sin x}{x}$ |
| | Day 16 | Standard Limits $\lim_{x \rightarrow a} \frac{a^x - 1}{x}$ $\lim_{x \rightarrow a} (1 + x)^{\frac{1}{x}}$ |
| Week 5 | Day 17 | Limit Practice Problems |
| | Day 18 | Concept of Differentiation by Definition |

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| Week 5 | Day 19 | Derivatives of e^x , $\sin x$, $\cos x$ |
| | Day 20 | Derivatives of $\tan x$, $e^x \log x$ |
| Week 6 | Day 21 | Sum, Product & Quotient Rule |
| | Day 22 | Chain Rule – Function of a Function |
| | Day 23 | Trigonometric & Inverse Trig Derivatives |
| | Day 24 | Unit II Revision & Test |
| UNIT III – Algebra | | |
| Week 7 | Day 25 | Complex Numbers: Real & Imaginary Parts |
| | Day 26 | Polar & Cartesian Form and its conversion |
| | Day 27 | Recall Conversion, Modulus, Amplitude (Argument) |
| | Day 28 | Conjugate, Addition, Subtraction, Multiplication, Division |
| Week 8 | Day 29 | De-Moivre's Theorem |
| | Day 30 | Application of De-Moivre's Theorem |
| | Day 31 | Introduction to Partial Fractions |
| | Day 32 | Proper Fractions: Non-repeated Linear Factors |
| Week 9 | Day 33 | Repeated & Quadratic Factors |
| | Day 34 | Improper Fractions to Partial Fractions |
| | Day 35 | Mixed Problem Practice |
| | Day 36 | Unit III Revision & Test |
| UNIT IV – Permutations, Combinations & Binomial Theorem | | |
| Week 10 | Day 37 | Introduction to Permutations |
| | Day 38 | $P(n,r)$: Formula and Problems |
| | Day 39 | Introduction to Combinations |
| | Day 40 | $C(n,r)$: Formula and Problems |
| Week 11 | Day 41 | Mixed Practice – P & C |
| | Day 42 | Binomial Theorem (Positive Integral Index) |
| | Day 43 | General and Middle Term |
| | Day 44 | Expansion for Any Index (without proof) |
| Week 12 | Day 45 | First & Second Binomial Approximation |
| | Day 46 | Applications to Engineering Problems |

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| Week 12 | Day 47 | Mixed Practice |
| | Day 48 | Unit IV Revision & Test |
| Final Review & Mock Exams | | |
| Week 13 | Day 49 | Trigonometry – Final Review |
| | Day 50 | Differential Calculus – Final Review |
| | Day 51 | Algebra – Final Review |
| | Day 52 | P & C & Binomial – Final Review |
| Week 14 | Day 53 | Mock Test 1 – Part A (Units I & II) |
| | Day 54 | Discussion of Mock Test 1 |
| | Day 55 | Mock Test 2 – Part B (Units III & IV) |
| | Day 56 | Discussion of Mock Test 2 |
| Week 15 | Day 57 | Full Syllabus – Summary |
| | Day 58 | Quick Formulas & Key Tricks |
| | Day 59 | Final Doubts & Preparation |
| | Day 60 | Grand Test (Full Syllabus) |

Recommended Book

1. Dr. Deepak Singh, Mathematics-I (Downloaded from: <https://ekumbh.aicte-india.org/dbook.php>)

8/7/25
 Concern Faculty
 Dept. of Math & Sc.

18/5/25
 HOD
 Dept. of Math & Sc.
 Govt. Polytechnic Kandhamal