**2025–2026 onwards**

**Allied Mathematics –I for Physics , Chemistry and Physics (CA)**

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| **Course Code** | | |  | **Allied Mathematics-1** | **L** | **T** | **P** | | | **C** | |
| **Core/elective/Supportive** | | | | **Allied** | **7** | **0** | **0** | | | **4** | |
| **Pre-requisite** | | | | Basic Knowledge in Mathematics | Syllabus  version | | | **2025-26**  **Batch** | | |  |
| **Course Objectives** | | | | | | | | | | | |
| On completion of this course the students should gain knowledge about finding Eigen values and Eigen vectors of a given matrix, solving first and second order differential equations using Laplace transforms, Fourier series which will be useful in their field of study. | | | | | | | | | | | |
| **Expected Course Outcomes** | | | | | | | | | | | |
| 1 | Demonstrate the basic concepts of matrices | | | | | | | | **K2** | | |
| 2 | Apply the learned concepts to solve various mathematical problems related to the domain | | | | | | | | **K3** | | |
| 3 | Apply the knowledge of solving differential equations using Laplace transform | | | | | | | | **K4** | | |
| 4 | Create interest in solving problems using and Fourier series | | | | | | | | **K5** | | |
| **K1–RememberK2–UnderstandK3–applyK4-AnalyzeK5–evaluate K6-Create** | | | | | | | | | | | |
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| **UNIT I** | | Matrices: | | | | | **15** | | | | |
| Eigen Values and eigen vectors, Cayley-Hamilton theorem (without proof) – Verification and computation of inverse | | | | | | | | | | | |
| **UNIT II** | | Trigonometry: | | | | | **15** | | | | |
| Expansion in Series – Expansion of cosn θ, sinn θ, in a series of cosines and sines of multiples of θ – Expansions of cosnθ and sinnθ in powers of sines and cosines | | | | | | | | | | | |
| **UNIT III** | | **Trigonometry** -continued | | | | | **15** | | | | |
| Hyperbolic functions and inverse hyperbolic functions-Problems in hyperbolic and inverse hyperbolic functions | | | | | | | | | | | |
| **UNIT IV** | | Laplace Transforms | | | | | **15** | | | | |
| . Definition – Laplace Transform of Standard functions – Linearity property – First shifting theorem – Transform of *tf(t), f(t ) / t* and derivatives – Inverse Laplace transforms of standard functions. | | | | | | | | | | | |

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| **UNIT V** | | Applications of Laplace transforms and Fourier series | **15** |
| Applications of Laplace transforms of differential equations of first and second order – Fourier series of functions in (0, 2π). | | | |
| **Total Lecture hours** | | | **75**  **Hours** |
| **Text Book(s)** | | | |
| **1** | Kandasamy. P, Thilagavathi. K “Allied Mathematics”, Volume I and II, S.Chand and Company Ltd, New Delhi, 2004 | | |
| **Reference Book(s)** | | | |
| **1** | T.K. Manichavasagam Pillai and S.Narayanan, Trigonometry - Viswanathan Publishers and Printers Pvt. Ltd. | | |
| 2 | S. Narayan and T.K. Manicavachagam Pillay “Ancillary Mathematics”, Viswanathan Publishers and Printers Pvt. Ltd. | |  |
| **Course Designed by: Dr. S.Nareshkumar, Dr.E.Tamilmani** | | | |

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|  | **PO1** | **PO2** | **PO3** | **PO4** | **PO5** | **PO6** | **PO7** | **PO8** | **PO9** | **PO10** |
| **CO1** | **M** | **L** | **L** | **L** | **L** | **L** | **L** | **L** | **L** | **L** |
| **CO2** | **M** | **L** | **L** | **L** | **L** | **L** | **L** | **L** | **L** | **L** |
| **CO3** | **S** | **M** | **L** | **L** | **L** | **L** | **L** | **L** | **L** | **L** |
| **CO4** | **S** | **M** | **M** | **L** | **L** | **L** | **L** | **L** | **L** | **L** |

\*S-Strong;M-Medium;

**2025–2026 onwards**

**Allied Mathematics –II for Physics , Chemistry and Physics (CA)**

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| **Course Code** | | |  | **Allied Mathematics-1I** | **L** | **T** | **P** | | | **C** | |
| **Core/elective/Supportive** | | | | **Allied** | **7** | **0** | **0** | | | **4** | |
| **Pre-requisite** | | | | Basic Knowledge in Mathematics | Syllabus  version | | | **2025-26**  **Batch** | | |  |
| **Course Objectives** | | | | | | | | | | | |
| On successful completion of course the students should have gained knowledge about multiple integrals, Beta, Gamma functions and its application. Learn the partial differential equation types and integration of vectors | | | | | | | | | | | |
| **Expected Course Outcomes** | | | | | | | | | | | |
| 1 | Demonstrate the basic concepts of multiple integrals | | | | | | | | **K2** | | |
| 2 | Apply the learned concepts to solve various mathematical problems related to the domain | | | | | | | | **K3** | | |
| 3 | Apply the knowledge of beta and gamma functions in solving multiple integrals | | | | | | | | **K4** | | |
| 4 | Create interest in solving PDE problems and vector theorem | | | | | | | | **K5** | | |
| **K1–RememberK2–UnderstandK3–applyK4-AnalyzeK5–evaluate K6-Create** | | | | | | | | | | | |
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| **UNIT I** | | **DOUBLE INTEGRALS** | | | | | **15** | | | | |
| Evaluation of double integrals - Application of double integral to find the area between curves. | | | | | | | | | | | |
| **UNIT II** | | **TRIPLE INTEGRALS** | | | | | **15** | | | | |
| Evaluation of triple integrals – Beta and Gamma functions – relations between them – Problemsolving using Beta and Gamma functions | | | | | | | | | | | |
| **UNIT III** | | **SOLVING DIFFERENTIAL EQUATIONS** | | | | | **15** | | | | |
| Solving second order linear differential equations with constant coefficients whose R.H.S is of the form vemx, where v is any function of x - Linear equations with variable coefficients. | | | | | | | | | | | |
| **UNIT IV** | | **SCALAR AND VECTOR FIELDS** | | | | | **15** | | | | |
| . Scalar and vector fields –Differentiation of vectors – Gradient, Divergence and Curl -Integration of  vectors | | | | | | | | | | | |

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| **UNIT V** | | **LINE AND SURFACEINTEGRALS** | **15** |
| line integral – surface integral – Green’s theorem in the plane – Gauss divergence theorem –  Strokes theorem – (Statements and simple problems only). | | | |
| **Total Lecture hours** | | | **75**  **Hours** |
| **Text Book(s)** | | | |
| **1** | Kandasamy. P, Thilagavathi. K “ Mathematics for B.Sc. Branch I”, Volume II, III and IV, S.Chand and Company Ltd, New Delhi, 2004. | | |
| **Reference Book(s)** | | | |
| **1** | T.K. Manichavasagam Pillai and S.Narayanan, Trigonometry - Viswanathan Publishers and Printers Pvt. Ltd. | | |
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| **Course Designed by: Dr. S.Nareshkumar, Dr.E.Tamilmani** | | | |

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|  | **PO1** | **PO2** | **PO3** | **PO4** | **PO5** | **PO6** | **PO7** | **PO8** | **PO9** | **PO10** |
| **CO1** | **M** | **L** | **L** | **L** | **L** | **L** | **L** | **L** | **L** | **L** |
| **CO2** | **M** | **L** | **L** | **L** | **L** | **L** | **L** | **L** | **L** | **L** |
| **CO3** | **S** | **M** | **L** | **L** | **L** | **L** | **L** | **L** | **L** | **L** |
| **CO4** | **S** | **M** | **M** | **L** | **L** | **L** | **L** | **L** | **L** | **L** |

\*S-Strong;M-Medium;