

**CH 258 APPLIED MATHEMATICS IN CHEMICAL ENGINEERING**  
**CREDITS= 5 (L = 4, T=1, P = 0)**

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|---|---|-------------|
| 1 | <b>Treatment of engineering data:</b><br>Empirical equations, Interpolation-Newton's forward & backward difference method, Lagrange's method, Graphical integration, Numerical integration- Simpson's 1/3rd & 3/8th Rule, Trapezoidal rule, Errors and their analysis, Regression & Correlation - Least square method, Multiple Regression. | 10<br>Hours |
| 2 | <b>Numerical solution of ordinary &amp; partial differential equations:</b><br>Numerical solution of ODE - Euler's method, Modified Euler's method, Method of Runge - Kutta (Fourth order), Numerical solution of PDE- Finite difference technique.   | 10<br>Hours |
| 3 | <b>The laplace transform:</b><br>Transformation method, Properties of transformation, the inverse transformation, Convolution, Application to chemical engineering problems.  | 6<br>Hours  |
| 4 | Measurement Data and Sampling Densities, Tests of Hypothesis, Error Analysis of Experiments.  | 6<br>Hours  |
| 5 | <b>Statistical quality control:</b><br>Introduction, Control charts for measurement & attributes, Causes of deviation from standards, Basis & method of control, Single sampling plan, and Advantages & limitations of SQC.   | 8<br>Hours  |

**REFERENCE BOOKS:**

Title: Mathematical Methods in Chemical Engineering  
Author: Jenson & Jeffreys  
Publisher: Academic Press, New York.

Title: Applied Mathematics in Chemical Engineering  
Author: Mickley Sherwood, Reed,  
Publisher: Tata - McGraw Hill

Title: Probability & Statistics for Engg  
Author: Richard Johnson  
Publisher: PHI Pvt. Ltd.

Title: Quality Control & Applications  
Author: Hansen & Ghare  
Publisher: PHI Pvt. Ltd.

**Tutorials:**

1. Total 10 to 12 tutorials for problem solving covering course contents of :  
Treatment of Engineering data, Numerical solution of ODEs and PDEs, Laplace transform, Test of hypothesis, Statistical quality Control and MATLAB
2. Home assignment