CH263	COMPUTATIONAL PROGRAMMING LAB	L	T	P	C	Int	Ext
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Semester IV [Second Year]

COURSE OBJECTIVES:

1. To understand the classification of various mathematical equations
2. To understand the application of numerical methods (iterative) to solve the non-linear, transcendental and linear algebraic equations
3. To understand the application of computational tool to solve mathematical model equations of chemical processes/operations
4. To understand how to write the programmes to solve the mathematical equations of chemical processes such as linear, non-linear, ordinary differential equations and partial differential equations
5. To interpolate and extrapolate the given data by using interpolation formulae or plotting in computational platforms
6. To understand how to write programme for numerical differentiation and numerical integration to solve chemical engineering problems

COURSE OUTCOMES:

After the successful completion of the course,students are able to

1. Apply the numerical method to solve various equations
2. Write the algorithms for various numerical methods to solve model equations
3. Write the programmes to compute various chemical quantities by solving the model equations
4. Interpolate the data by using computational tools

EXPERIMENTS:

1. Solution of Non-linear algebraic equations and Transcedantal equations by Bisection Method
2. Solution of non-linear algebraic equations and Transcedantal equations by Regula - Flasi Method
3. Solution of non-linear algebraic equations and Transcedantal equations by Newton - Raphson Method
4. Estimation of the pressure drop in a pipe by Numerical Simulation
5. Estimation of Molar Volume by using Numerical Simulation
6. Solution of Simultaneous non-linear algebraic equations by Newton Method
7. Solution of Linear Algebraic Equations by Matrix Inverse method, Crammers rule, Gauss Eliminaiton and Gauss Siedel Methods
8. Computation of material and energy balance equations by using Numerical Simulation
9. Lagranges Interpolation
10. Newtons Forward and Backward interpolation
11. Numerical differentiation and integration - Chemical Engineering applications
12. Computation of Bubble point and Dewpoint pressure and temperature
13. Linear Regression - Curve fitting by method of least squares
14. Solution of ordinary diffrential equations by Euler and R-K fourth order methods - Heat Transfer and Chemical Reaction Engineering applications