科目：**數值微分方程(Numerical Differential Equations)**

參考書：1. Atkinson K. E. : An Introduction to Numerical Analysis, 2nd Ed, John Wiley & Sons, 1989.

2. Hall C. A. and Porsching T. : Numerical Analysis of Partial Differential Equations, Prentice Hall, 1990.

開設課程：兩年開一次

數值分析（部份）、數值常微分方程、數值偏微分方程、有限元分析、有限差分分析

Topics：

1. Error and stability analysis : convergence rate, condition number.
2. Interpolation theory : Lagrange, Hermite and piecewise polynomials interpolation.
3. Numerical differentiation and integration : Newton-Cotes formula, Gaussian quadrature, Romberg integration.
4. Numerical ODE : initial value problems (Euler's, Taylor's, multistage, Runge-Kutta and Adams methods) and boundary value problems (linear shooting, finite difference, method of weighted residual, and Rayleigh-Ritz methods).
5. Numerical PDE : finite difference and finite element methods for elliptic, parabolic and hyperbolic problems.