

## QE ขอบเขตเนื้อหา รายวิชา 2301653 **Numerical Analysis I**

### **1. Numerical methods for systems of linear equations**

- Direct methods – Gaussian elimination and pivots, LU-type factorizations
- Iterative methods – Jacobi, Gauss-Seidel and SOR methods

### **2. Iterative methods for nonlinear systems**

- Fixed point methods
- Newton-Raphson methods

### **3. Numerical methods for initial value problem ODEs**

- One-step methods – Taylor's, Euler, modified Euler, RK methods
- Multi-step methods – Adams-Bashforth, Adams-Moulton, Milne methods

### **4. Numerical methods for 2-point boundary value problem ODEs**

- Shooting methods for linear/nonlinear problems
- Finite difference methods for linear/nonlinear problems

### **5. Finite difference methods for linear PDEs**

- Methods for elliptic PDEs
- Methods for parabolic PDEs (heat equations)
- Methods for hyperbolic PDEs (wave equations)