博士班資格考試筆試各科目考試範圍與參考書目

常微分方程

考試範圍：

1. **Existence and uniqueness of solutions:**
   existence of solution, uniqueness of solution, the method of successive approximations, continuation of solutions, systems of differential equations, higher order equation, dependence or variation of solutions with respect to initial conditions and parameters, extension of the idea of a solution, maximum and minimum solutions.

2. **Linear differential equations:**
   linear homogeneous and nonhomogeneous systems, linear differential equations of order n, linear systems with constant or periodic or analytic coefficients, asymptotic behavior of solutions.

3. **Asymptotic behavior of linear systems containing large parameter:**
   asymptotic behavior of solutions, the case of equal characteristic roots.

4. **Oscillation and comparison theorems for second order linear equations:**
   comparison theorems, existence of eigenvalues, periodic boundary conditions, stability regions of second order equation with periodic coefficients problem.

參考書目：

[1] E. A. Coddington and N. Levinson, Theory of ordinary differential equations.
[2] R. K. Miller and A. N. Michel, Ordinary differential equations.
[3] P. Hartman, Ordinary differential equations.