Course Description and Prerequisites

This course essentially consists of two major parts:

I. Periodic time-dependent evolution systems and perturbations

(a) Floquet theory for ODEs and PDEs
(b) Methods of perturbation: matched and composite expansions, strained coordinates, multiple scales, averaging, and asymptotics

II. Gauge theory, symmetries and Higgs bosons

(a) Elementary theory of differential geometry;
(b) Symmetry groups and invariance;
(c) Yang-Mills theory and Higgs bosons

Prerequisites: Graduate level mathematical maturity.
Textbook: None. References will be selected from literature.

Grading policy: There will be no exams. Students will be assigned to read a collection of references, be encouraged to write research reports and give some presentations.