

MATH 689-602 Special Topics in Mathematical Physics, Fall 2015

Time: TR 12:45-2:00pm

Classroom: TBA

Instructor: Prof. Goong Chen, Room 621E Blocker Bldg. Ph. 979-845-7336

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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.