

Course Syllabus 113-2

Course name: Mathematical Physics(II)

Instructor: Chen-Pin Yeh(葉振斌)

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Office hours: Wednesday 10:00-12:00, Room B111, Tel:3739

Instruction hour: Wednesday 9:10-12:00 (with a 20 mins break)

Classroom: Room A209

Course website: <http://www.elearn.ndhu.edu.tw/moodle>

(announcements and homeworks will be posted here)

Topics: Group theory, Lie Algebra, Symmetry in Physics

Pre-Requisites: Linear Algebra (Matrix and Vector Analysis), Quantum Physics, Applied Mathematics

Grading: Attendance:40%

Homework:30%

Midterm:15%(April 16, 2023 Wednesday 9:00-12:30)

Final exam: 15% (June 11, 2023 Wednesday 9:00-12:30)

Textbook:

Group Theory in a Nutshell for Physicists, A. Zee

References:

1. Group Theory in Physics, Wu-Ki Tung
2. Lie Algebras in Particle Physics(2nd edition), H. Georgi
3. Lectures on Lie Groups, J. Frank Adams
4. Abstract Algebra (3rd edition), D. Dummit and R. Foote

Schedule : (a tentative plan)

Week	Topics
1(2/19)	Course introduction, Review of linear algebra
2(2/26)	Introduction to Groups
3(3/5)	Examples of Groups

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Week	Topics
4(3/12)	Basic concepts in Groups
5(3/19)	Basic concepts in Groups
6(3/26)	Group representations
7(4/2)	Group representations
8(4/9)	Group representations
9(4/16)	Mitderm on 4/16
10(4/23)	Introduction to Lie groups and Lie algebras
11(4/30)	Introduction to Lie groups and Lie algebras
12(5/7)	SO(N) and tensors
13(5/14)	SO(N) and tensors
14(5/21)	Lorentz group
15(5/28)	Lorentz tensors and spinors
16(6/4)	Lorentz tensors and spinors
17(6/11)	Final on 6/11

Note:

1.Homeworks will be posted on the e-learning website (roughly bi-weekly). Please hand in to me on next week's class. No late homework is allowed, except noticing me for the reason before the due date.

2.Cheating in exams will result in zero grade.