William & Mary
DEPARTMENT OF MATHEMATICS

Math 410
Representation Theory

Spring 2018

The information below is given tentatively and subject to changes during the term.

General Organization

Textbook: *An introduction to the representation theory of groups* by E. Kowalski, Graduate Studies in Mathematics, vol. 155

Scheduled meetings: Thursdays 12:30 - 2:00 in Jones 131

Instructor: Pierre Clare (130 Jones Hall)

Office hours: by appointment.

Last day to add/drop	Jan. 26
Spring Break	Mar. 5 - 11
Last day to withdraw	Mar. 16

Grades

The course grade will be based upon participation and oral presentations.

Course Material

Learning Objectives

We will study the fundamentals of representation theory for groups with an eye towards non-commutative harmonic analysis. The basic vocabulary and concepts will be presented in the abstract algebraic framework. Then, we will introduce the topological and measure-theoretic background required to discuss unitary representations of locally compact groups. The Peter-Weyl theory for compact groups will be presented in detail. The general theory of the Harish-Chandra Plancherel formula for semisimple groups will be illustrated in the fundamental case of $SL(2, \mathbb{R})$.

Schedule of Topics

Date	Speaker	Topic
Jan. 18	PC	Groups and representations
Jan. 25	PC	Subrepresentations, irreducibles, intertwining operators
Feb. 1st	C. Hambric	Schur's Lemma
Feb. 8	PC	The regular representation
Feb. 15	J. Gliozzi	Semisimplicity and complete reducibility
Feb. 22	PC	Hilbert spaces and unitary representations
Mar. 1st	C. Hambric	Schur's Lemma and complete reducibility for unitary representations
Spring Break		
Mar. 15	A. Mohan	Topological groups
Mar. 22	A. Michel	Haar measures on locally compact groups
Mar. 29	A. Michel	Measure theory for compact groups
Apr. 5	PC	Unitary representations of compact groups: Peter-Weyl theory
Apr. 12	J. Gliozzi	Representations of $SU(2)$
Apr. 19	PC	Induced representations
Apr. 26	PC	The Harish-Chandra-Plancherel formula for $SL(2, \mathbb{R})$

ADA Considerations

William & Mary accommodates students with disabilities in accordance with federal laws and university policy. Any student who feels they may need an accommodation based on the impact of a health diagnosis should contact Student Accessibility Services at sas@wm.edu. Visit **wm.edu/sas** for more information.