Ergodic Theory 2

Instructor and Class Information

Lecturer: Course Num.:  
Office: Lecture Room:  
Phone: Lecture Times:  
Email: Office Hours:  

About Course Goals

**FORMAT**
The course will meet three times a week for 55 minutes each meeting. Instruction will be mainly by lecture delivered by the instructor. It may also include occasional in-class discussions as well as short student presentations, particularly, by post-candidacy students.

**DESCRIPTION & GOALS**
This course sequence is aimed at providing students with a solid working knowledge of the basic concepts, important techniques, examples and connections of Ergodic Theory, and constitutes a natural continuation of the Math 7221 (Ergodic Theory I). The course should be of interest to all students with research interests in various flavors of Ergodic Theory and dynamical systems, and its applications to study problems in Combinatorics, Number theory, Homogeneous Dynamics, Differential equations, Probability theory etc.

**PREREQUISITES**
Math 7221 or permission of the instructor

Textbook

**MAIN REFERENCES**

**ADDITIONAL REFERENCES**
Assessments

**Homework Assignments**
There will be approximately 6 homework assignment sheets, which will typically contain several fully described problems as well as a list of numbers of textbook problems. Due dates of assignments will be announced and set typically a week after the assignments are published.

**Final Project**
The final project is a more extensive written assignment that will draw on techniques acquired throughout the semester. It will be published about two weeks before the end of classes and will be due at the beginning of finals week.

**Class Participation and Attendance**
Although attendance is not regularly monitored frequent absences are likely to be noted and may factor into the grade in borderline cases.

**Grading**

**Course Score**
A course score will be computed from the above assessments. Homework assignments will count 70% towards the grade and the final project 30%.

**Letter Grades**
Letter grades will be determined based on the course score. The approximate minimum scores for letter grades are 80% for an “A”, 73% for an “A-”, 67% for a “B+”, 55% for a “B-”, and 40% for a “C-”. The exact cut-off scores may vary depending on the difficulty of assignments.

**Weekly Schedule**

<table>
<thead>
<tr>
<th>Week 1</th>
<th>Basic principles of Ergodic Ramsey Theory</th>
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<tbody>
<tr>
<td>Week 2</td>
<td>Furstenberg’s correspondence principle</td>
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<tr>
<td>Week 3</td>
<td>Review of mixing properties of measure-preserving systems</td>
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<td>Week 4</td>
<td>Multiple recurrence for weakly mixing systems</td>
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<td>Week 5</td>
<td>Structure theory of measure-preserving system</td>
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<td>Week 6</td>
<td>Ergodic Szemeredi theorem</td>
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<td>Week 7</td>
<td>Ergodic theory along polynomials; polynomial Szemeredi theorem</td>
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<td>Week 8</td>
<td>Ergodic theory and IP sets; refinements of multiple recurrence results</td>
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<td>Week 9</td>
<td>Ergodic theory and amenable groups</td>
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<td>Week 10</td>
<td>Flows on homogeneous spaces I</td>
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<tr>
<td>Week 11</td>
<td>Flows on homogeneous spaces II</td>
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<tr>
<td>Week 12</td>
<td>Diophantine applications of ergodic theory</td>
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<tr>
<td>Week 13</td>
<td>Miscellaneous topics</td>
</tr>
<tr>
<td>Week 14</td>
<td>Open problems and suggestions for future research</td>
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General Policies

ACADEMIC MISCONDUCT

It is the responsibility of the Committee on Academic Misconduct to investigate or establish procedures for the investigation of all reported cases of student academic misconduct. The term “academic misconduct” includes all forms of student academic misconduct wherever committed; illustrated by, but not limited to, cases of plagiarism and dishonest practices in connection with examinations. Instructors shall report all instances of alleged academic misconduct to the committee (Faculty Rule 3335-5-487). For additional information, see the Code of Student Conduct (http://studentaffairs.osu.edu/info_for_students/csc.asp).

DISABILITY SERVICES

Students with disabilities that have been certified by the Office for Disability Services will be appropriately accommodated and should inform the instructor as soon as possible of their needs. The Office for Disability Services is located in 150 Pomerene Hall, 1760 Neil Avenue; telephone 292-3307, TDD 292-0901; http://www.ods.ohio-state.edu/.