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
This section is open only to mathematics post-candidacy students and requires, in addition, the permission of the instructor.

Textbook

MAIN REFERENCES

ADDITIONAL REFERENCES
Assessments

**READING, PARTICIPATION, AND ATTENDANCE**
Students are required to read scheduled textbook materials and actively participate in class room discussions that arise from lecture material. Students are expected to attend all classes.

**RESEARCH ORIENTED PRESENTATION**
Post-candidacy students in this section are required to deliver a half hour presentation that both synthesizes lecture material and connects it to relevant research questions, more advanced theoretical topics, or applications in other fields of mathematics. The topic and required independent reading will be determined by the instructor individually in negotiation with the student. Presentations may also be replaced by respective research papers upon the request of the student.

Grading

**COURSE GRADE**
The grades for this course section are "satisfactory" (S) or "unsatisfactory" (U). A satisfactory outcome requires continued active participation in class (weighed about 20%) and is further based on the student's performance during the presentation (weighed about 80%).

Weekly Schedule

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

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/.