

**SYLLABUS: GRAPH THEORY**  
**MATH 7237/8237 FALL TERM 2017**

1. COURSE DETAILS

Instructor: Associate Professor Dr. David J. Grynkiewicz

Office: Dunn Hall 376

Office Hours: WF 12:30 – 13:30 and by appointment

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Location: Dunn Hall 231

Time: MWF 10:20 – 11:15

Textbook: *Algebraic Graph Theory* by **Godsil** and **Royle** (Springer Graduate Textbooks in Mathematics series 207).

**Summary.** Graph Theory has a strong tradition in Memphis but its full scope is so vast that many topics are too often neglected in introductory courses for want of sufficient time! This course is an advanced course in Graph Theory (at the Ph.D. level) that will fill in this unfortunate gap. The running theme will be the interplay between seemingly distinct areas of mathematics: Algebra and Graph Theory. We will use the text *Algebraic Graph Theory* by Godsil and Royle (GTM 207) with the aim to give a tour of the more algebraic aspects of Graph Theory. Along the way, we'll encounter examples of particularly nice graphs, see how groups act on graphs, study transitive graphs and graph homomorphisms, and watch matrices make stellar star appearances. Other more familiar topics (e.g., planar graphs, graph colorings, matchings, hamiltonian cycles, flows,...), will be re-introduced as they occur during the course of the semester.

**Prerequisites.** A basic background in Graph Theory and Algebra (at the undergraduate level) is expected. Students should be familiar with Groups, Matrices, Graphs, and rigorous proof-based mathematics, though no in-depth knowledge of these topics is required.

**Course Format.** The course will have a seminar format, meaning there will be more emphasis on attending lectures and asking questions, with a limited amount of homework given during the semester. Final evaluation will be based on student presentations at the end of the semester.

**Grading Scheme.** Percentage of classes attended (20%), Homework Average (20%), Final Presentation (60%). Excused absences will not count against a student's attendance

Students may collaborate and help each other on the homework, but each student must write up the solution independently, in their own words and unaided. Simply transcribing someone else's solution can have serious consequences.