



Proposal Form For Addition And Revision Of Courses

1. Proposing College / School: COSAM
Department: Mathematics and Statistics

2. Course Prefix and Number: MATH 7700 **3. Effective Term:** Fall 2015

4. Course Title: Advanced Graph Theory
Abbreviated Title (30 characters or less):

5. Requested Action:

Renumber a Course Current Course Number:
 Add a Course Proposed Course Number:
 Revise a Course Type of Revision:

6. Course Credit:

	Contact/Group Hours	Scheduled Type <small>(e.g.: Lab, Lecture, Practicum, Directed Study)</small>	Weekly or Per Term?	Credit Hours	Anticipated Enrollment
Maximum Hours (Repeatability): 3	3	Lecture	Weekly	3	12
Total Credit Hours: 3					

7. Grading Type: Regular (ABCD) Satisfactory/Unsatisfactory (S/U) Audit

8. Prerequisites/Corequisites: None
Use "P:" to indicate a prerequisite, "C:" to indicate a corequisite, and "P/C:" to indicate a prerequisite with concurrency.

9. Restrictions: *List specific restriction in space above.* College Major Standing Degree

10. Course Description: Algorithmic, enumerative and theoretical aspects of graph theory: matchings and factors, colorings, Hamiltonicity, connectivity, trees, extremal graphs, planarity
(20 Words or Less; exactly as it should appear in the Bulletin)

11. May Count Either: 6750 or 7700 *(Indicate if this particular course cannot be counted for credit in addition to another)*

	<u>Program Type</u> <small>(e.g.: minor, major, etc.)</small>	<u>Program Title</u> <small>(e.g.: MS in Chemistry, Performance Option, Minor in Art)</small>	<u>Requirement or Elective?</u> <small>(required or optional?)</small>
12. Affected Program(s): <i>(Respond "N/A" if not included in any program; attach memorandum if more space is required)</i>	N/A		

13. Overlapping or Duplication of Other Units' Offerings: Applicable
(If course is included in any other degree program, is used as an elective frequently by other unit(s), or is in an area similar to that covered by another college/school, attach correspondence with relevant unit) Not Applicable

14. Justification:

We have been using 6750 as the first in a 2-course PhD prelim sequence, but have found that the depth required for such students is not easily handled in a class that includes undergraduates. So all PhD students will now be expected to take this course instead of 6750. (6750 still plays an important role for masters students, especially students with less mathematical backgrounds.)

(Include a concise, yet adequate rationale for the addition/revision of the course, citing accreditation, assessments (faculty, graduate, and/or external) where applicable)

15. Resources:

No additional resources will be required.

(Indicate whether existing resources such as library materials, classroom/laboratory space, and faculty appointments are adequate to support the proposed addition/revision; if additional resources are required, indicate how such needs will be met, referencing the appropriate level of authorization -- i.e.: Dean -- where necessary; if no additional resources or shifting of resources will be necessary, respond "Not Applicable")

16. Student Learning Outcomes:

Students should be able to:

1. Demonstrate problem solving skills.
2. Be able to write graph theoretic proofs.
3. Be able to read and understand technical graph theoretic research papers.
4. Be able to apply algorithmic approaches to solving graph theoretic problems.

(State in measurable terms (reflective of course level) what students should be able to do when they have completed this course)

17. Course Content Outline:

The course will include most of (the specifics depend on the teacher):

1. Introduction, Basic Results, Adjacency Matrices, Walks (2 weeks)
2. Trees: spanning, enumeration (Cayley's Theorem) (1-2 weeks)
3. Connectivity: Menger's Theorem (1-2 weeks)
4. Hamilton Cycles: Dirac and Chvatal Theorems (2-3 weeks)
5. Matchings: Hall and Tutte's Theorems; factors and factorizations (2-3 weeks)
6. Colorings: edges (Vizing) and vertices (chromatic polynomials) (2-3 weeks)
7. Planarity: Euler and Kuratowski Theorems (1 week)
- 8 Directed Graphs (1 week)

(Provide a comprehensive, week-by-week breakdown of course content, including assignment due dates)

18. Assignments / Projects:

Typically students will be given 4 deep written assignments and 1 reading assignment that results in an oral presentation of the graph theoretic research paper read by the student.

(List all quizzes, projects, reports, activities and other components of the course grade -- including a brief description of each assignment that clarifies its contribution to the course's learning objectives)

19. Rubric and Grading Scale:

Each of the 5 assignments is typically worth 20% of the grade. Written assignments each typically involve 4 or 5 questions, with points allocated based on the difficulty of the problem and length of required proofs.

(List all components of the course grade -- including attendance and/or participation if relevant -- with point totals for each; indicate point totals and ranges or percentages for grading scale; for S/U grading, detail performance expectations for a passing grade)

20. Justification for Graduate Credit:

Understanding of deep mathematical proofs, reading of current research, and high level problem solving skills will all be expected and developed in this course.

(Include a brief statement explaining how the course meets graduate educational standards (i.e.: rigorous standards for evaluation, development of critical thinking and analytical skills, etc.))

(Included below are standard statements regarding course policies. If necessary, a statement may be altered to reflect the academic policies of individual faculty members and/or the academic unit or department, provided that there is no conflict with the Student Policy eHandbook, Faculty Handbook, or any existing university policy.)

POLICY STATEMENTS

Attendance: Although attendance is not required, students are expected to attend all classes, and will be held responsible for any content covered in the event of an absence.

Excused Absences: Students are granted excused absences from class for the following reasons: illness of the student or serious illness of a member of the student's immediate family, the death of a member of the student's immediate family, trips for student organizations sponsored by an academic unit, trips for university classes, trips for participation in intercollegiate athletic events, subpoena for a court appearance, and religious holidays. Students who wish to have an excused absence from class for any other reason must contact the instructor in advance of the absence to request permission. The instructor will weigh the merits of the request, and render a decision. When feasible, the student must notify the instructor prior to the occurrence of any excused absences, but in no case shall such notification occur more than one week after the absence. Appropriate documentation for all excused absences is required. Please consult the [Student Policy eHandbook](#) for more information on excused absences.

Make-Up Policy: Arrangement to make up a missed major examination (e.g.:hour exams, mid-term exams) due to properly authorized excused absences must be initiated by the student within one week of the end of the period of the excused absence(s). Except in unusual circumstances, such as the continued absence of the student or the advent of university holidays, a make-up exam will take place within two weeks of the date that the student initiates arrangements for it. Except in extraordinary circumstances, no make-up exams will be arranged during the last three days before the final exam period begins.

Academic Honesty Policy: All portions of the Auburn University student academic honesty code (Title XII) found in the [Student Policy eHandbook](#) will apply to university courses. All academic honesty violations or alleged violations of the SGA Code of Laws will be reported to the Office of the Provost, which will then refer the case to the Academic Honesty Committee.

Disability Accommodations: Students who need accommodations are asked to electronically submit their approved accommodations through AU Access and to arrange a meeting during office hours the first week of classes, or as soon as possible if accommodations are needed immediately. If you have a conflict with my office hours, an alternate time can be arranged. To set up this meeting, please contact me by e-mail. If you have not established accommodations through the Office of Accessibility, but need accommodations, make an appointment with the Office of Accessibility, 1228 Haley Center, 844-2096 (V/TT).

Approvals

W. Nicotera

Department Chair / Head

[Signature]

2/4/2015

Date

2/10/2015

College / School Curriculum Committee

[Signature]

Date

2/10/2015

College / School Dean

Date

Dean of the Graduate School *(for Graduate Courses)*

Date

Assoc. Provost for Undergraduate Studies *(for Undergraduate Courses)*

Date

Contact Person:

Telephone:

E-Mail Address:

Fax: