<table>
<thead>
<tr>
<th>Department</th>
<th>Mathematics and Statistics</th>
<th>College/School</th>
<th>CNSM</th>
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<tbody>
<tr>
<td>Prepared by</td>
<td>Elizabeth Allman</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Email Contact</td>
<td><a href="mailto:e.allman@uaf.edu">e.allman@uaf.edu</a></td>
<td>Faculty Contact</td>
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1. ACTION DESIRED
(CHECK ONE):
- [ ] Trial Course
- [x] New Course

2. COURSE IDENTIFICATION:
- Dept: MATH
- Course #: F320
- No. of Credits: 3

Justify upper/lower division status & number of credits:
This course is an elective for majors; three credits is appropriate for the content and depth of material.

3. PROPOSED COURSE TITLE:
Topics in Combinatorics

4. CROSS LISTED?
- [ ] Yes
- [x] No

(Check one: Every or Alternate) Fall, Spring, Summer - or As Demand Warrants

5. STACKED?
- [ ] Yes
- [x] No

6. FREQUENCY OF OFFERING:
Fall semester odd-numbered years

7. SEMESTER & YEAR OF FIRST OFFERING (if approved)
Fall 2011

8. COURSE FORMAT:
- Course Format: Lecture
- Mode of delivery: Lecture

- COURSE FORMAT (check one):
  - [ ] 1
  - [ ] 2
  - [ ] 3
  - [ ] 4
  - [x] 5
  - [ ] 6

- OTHER FORMAT (specify):
lecture

9. CONTACT HOURS PER WEEK:
- [ ] 3 LECTURE hours/week
- [ ] LAB hours/week
- [ ] PRACTICUM hours/week

Note: # of credits are based on contact hours. 800 minutes of lecture=1 credit. 2400 minutes of lab in a science course=1 credit. 1600 minutes in non-science lab=1 credit. 2400-4800 minutes of practicum=1 credit. 2400-8000 minutes of internship=1 credit. This must match with the syllabus. See http://www.uaf.edu/uafgov/faculty/cd/credits.html for more information on number of credits.

- OTHER HOURS (specify type)

10. COMPLETE CATALOG DESCRIPTION including dept., number, title and credits (50 words or less, if possible):
MATH F320 Topics in Combinatorics 3 credits. Offered Fall Odd-numbered years.

An introduction to some of the fundamental ideas of combinatorics. Topics
selected from such fields as enumerative combinatorics, generating functions, set systems, recurrence relations, directed graphs, matchings, Hamiltonian and Eulerian graphs, trees, and graph colorings.

Prerequisites: MATH F215 or permission of instructor

<table>
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<tr>
<th>11. COURSE CLASSIFICATIONS: (undergraduate courses only. Use approved criteria found on Page 10 &amp; 17 of the manual. If justification is needed, attach on separate sheet.)</th>
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<tbody>
<tr>
<td>H = Humanities</td>
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Will this course be used to fulfill a requirement for the baccalaureate core? [ ] YES [X] NO

IF YES, check which core requirements it could be used to fulfill:

- O = Oral Intensive, Format 6
- W = Writing Intensive, Format 7
- Natural Science, Format 8

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<th>12. COURSE REPEATABILITY:</th>
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<tr>
<td>Is this course repeatable for credit? [ ] YES [X] NO</td>
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Justification: Indicate why the course can be repeated (for example, the course follows a different theme each time).

How many times may the course be repeated for credit? TIMES

If the course can be repeated with variable credit, what is the maximum number of credit hours that may be earned for this course? CREDITS

<table>
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<tr>
<th>13. GRADING SYSTEM:</th>
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<td>LETTER: X PASS/FAIL:</td>
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RESTRICTIONS ON ENROLLMENT (if any)

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<th>14. PREREQUISITES</th>
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<tr>
<td>MATH 215 or permission of instructor</td>
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These will be required before the student is allowed to enroll in the course.

RECOMMENDED

Classes, etc. that student is strongly encouraged to complete prior to this course.

| 15. SPECIAL RESTRICTIONS, CONDITIONS |

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<th>16. PROPOSED COURSE FEES</th>
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Has a memo been submitted through your dean to the Provost & VCAS for

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<th>17. PREVIOUS HISTORY</th>
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Has the course been offered as special topics or trial course previously? Yes/No

If yes, give semester, year, course #, etc.: No, but it will be offered as a trial course in fall 2009.
18. ESTIMATED IMPACT
What impact, if any, will this have on budget, facilities/space, faculty, etc.
None.

19. LIBRARY COLLECTIONS
Have you contacted the library collection development officer (ffk1j@uaf.edu, 474-6695) with regard to the adequacy of library/media collections, equipment, and services available for the proposed course? If so, give date of contact and resolution. If not, explain why not.

20. IMPACTS ON PROGRAMS/DEPTS
What programs/departments will be affected by this proposed action?
Include information on the Programs/Departments contacted (e.g., email, memo)
N/A

21. POSITIVE AND NEGATIVE IMPACTS
Please specify positive and negative impacts on other courses, programs and departments resulting from the proposed action.
Positive: The Mathematics major has very few elective offerings for majors. This will strengthen the undergraduate curriculum. As two new faculty members will join the Department in fall 2009, there will be no negative impact on the Department’s service responsibilities or need for reallocation of faculty resources. Across the nation, most Mathematics Departments offer a course in combinatorics.
Negative: N/A

JUSTIFICATION FOR ACTION REQUESTED
The purpose of the department and campus-wide curriculum committees is to scrutinize course change and new course applications to make sure that the quality of UAF education is not lowered as a result of the proposed change. Please address this in your response. This section needs to be self-explanatory. Use as much space as needed to fully justify the proposed course.

The addition of new courses to the undergraduate curriculum serves to improve the undergraduate experience for majors, or students earning a minor in Mathematics or those simply interested in mathematics. The curriculum has been woefully weak on elective offerings because of short staffing in the department. This addition will greatly strengthen the Mathematics major. Across the nation, most Mathematics departments offer a course in combinatorics. This will put us in line with national norms.

APPROVALS:

<table>
<thead>
<tr>
<th>Approval</th>
<th>Date</th>
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<tbody>
<tr>
<td>Signature, Chair, Program/Department of:</td>
<td></td>
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<tr>
<td>Date</td>
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<tr>
<td>Signature, Chair, College/School Curriculum Council for:</td>
<td>Date</td>
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<tr>
<td>Signature, Dean, College/School of:</td>
<td>Date</td>
</tr>
<tr>
<td>Signature of Provost (if applicable):</td>
<td>Date</td>
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ALL SIGNATURES MUST BE OBTAINED PRIOR TO SUBMISSION TO THE GOVERNANCE OFFICE

Signature, Chair, UAF Faculty Senate Curriculum Review Committee

Date

ADDITIONAL SIGNATURES: (If required)

Signature, Chair, Program/Department of:

Date

Signature, Chair, College/School Curriculum Council for:

Date

Signature, Dean, College/School of:

Date
ATTACH COMPLETE SYLLABUS (as part of this application).
Note: syllabus must follow the guidelines discussed in the Faculty Senate Guide http://www.uaf.edu/uafgov/faculty/cd/syllabus.html.
The department and campus wide curriculum committees will review the syllabus to ensure that each of the items listed below are included. If items are missing or unclear, the proposed course change will be denied.

SYLLABUS CHECKLIST FOR ALL UAF COURSES
During the first week of class, instructors will distribute a course syllabus. Although modifications may be made throughout the semester, this document will contain the following information (as applicable to the discipline):

1. Course information:
   - Title, number, credits, prerequisites, location, meeting time (make sure that contact hours are in line with credits).

2. Instructor (and if applicable, Teaching Assistant) information:
   - Name, office location, office hours, telephone, email address.

3. Course readings/materials:
   - Course textbook title, author, edition/publisher.
   - Supplementary readings (indicate whether required or recommended) and any supplies required.

4. Course description:
   - Content of the course and how it fits into the broader curriculum;
   - Expected proficiencies required to undertake the course, if applicable.
   - Inclusion of catalog description is strongly recommended, and
   - Description in syllabus must be consistent with catalog course description.

5. Course Goals (general) and Student Learning Outcomes (more specific)

6. Instructional methods:
   - Describe the teaching techniques (eg: lecture, case study, small group discussion, private instruction, studio instruction, values clarification, games, journal writing, use of Blackboard, audio/video conferencing, etc.).

7. Course calendar:
   - A schedule of class topics and assignments must be included. Be specific so that it is clear that the instructor has thought this through and will not be making it up on the fly (e.g. it is not adequate to say “lab”. Instead, give each lab a title that describes its content). You may call the outline Tentative or Work in Progress to allow for modifications during the semester.

8. Course policies:
   - Specify course rules, including your policies on attendance, tardiness, class participation, make-up exams, and plagiarism/academic integrity.

9. Evaluation:
   - Specify how students will be evaluated, what factors will be included, their relative value, and
   - how they will be tabulated into grades (on a curve, absolute scores, etc.)

10. Support Services:
    - Describe the student support services such as tutoring (local and/or regional) appropriate for the course.

11. Disabilities Services:
    The Office of Disability Services implements the Americans with Disabilities Act (ADA), and insures that UAF students have equal access to the campus and course materials.
    - State that you will work with the Office of Disabilities Services (203 WHIT, 474-7043) to provide reasonable accommodation to students with disabilities.”
Course: Math 393
Course Number: 74935
Term: Fall 2009
Meeting Time: 11:45-12:45 MWF
Location: Gruening 306 MWF
Instructor: Dr. J. Gimbel
Office: Chapman 304 C
Phone: 474-6102
E-Mail: ffjgg@uaf.edu
Text: Introduction to Graph Theory by Douglas West
Prerequisite: Math 215 (or the equivalent) with a C grade or better. (Note, a C- grade will not suffice.)

Catalog Description: A study of set systems, topics from graphs and hypergraphs will be chosen by the instructor.

Grades: Grades are based on the following scale

90-100% A
80-90 B
70-80 C
60-70 D
0-60 F

The lower three percent in each category will get a - and the upper three percent will have a + added to their grades with the exceptions of A+, F+ and F-. These are not approved grades. This represents a guarantee. The instructor reserves the right to improve grades beyond what is shown here. Decisions made in borderline cases are based in part, but not exclusively, on class participation, punctuality, homework and quizzes done in a timely fashion and attention to learning from mistakes. Such judgments are made solely by the instructor.
Your grade has three components:

Homework  10%
Quizzes    10%
Exams      80%

There will be three mid-term exams and a final. All exams, including the final, have equal weight. All exams are open book. Notes are allowed in exams. Quizzes are closed book. Calculators may be used during exams and quizzes but may be forbidden on some problems. Laptop computers cannot be used in exams nor quizzes. Laptop computers can only be used in class for note taking. In particular, checking email and playing video games are not permitted.

You are graded not only on getting a correct answer, but clarity of exposition. Writing skills are important. Avoid shortcuts. Write clear and complete sentences. Knowing the correct answer is important. So is showing the steps in a correct solution. These steps need to be placed in a clear, sequential order.

Scheduling. You are responsible for familiarity with all information presented in class, even on days you are absent. The scheduling of quizzes may or may not be done in advance. The low quiz and homework scores will be dropped. Homework is due at the start of class. However, it may not always be collected at the start of class. It will be considered late if not turned in when collected. With the exception of university related trips and military exercises, homework and quizzes cannot be made up nor turned in late. Students adding this class late will not be able to turn in missing work. In the case of university related trips, these include travel for sports competition, the university orchestra and field trips for classes, in which case you must make arrangements prior to your travel. Any missed quiz or homework must be cleared in advance, if possible. Travel for work (even if working on a university grant) and sports practice will not excuse late work. Exceptions will be made for irregular military events. However, a normal military work schedule will not excuse late work.

Exams cannot be retaken. An exam will be considered to be taken if you have started it. Exams cannot be missed except in extreme cases. Determination of such cases will be made solely by the instructor. Extreme cases do not include missing tests for normal work nor vacations. Further, extreme cases do not include missing a test because it conflicts with a ride home or an airplane flight scheduled at the same time. Similarly, an exam will not be rescheduled because it conflicts with a routine military duty. If an excused absence for an exam can be scheduled ahead of time, it must be scheduled in advance. In which case, a clear
reason must be stated. Exams can be rescheduled for some religious and medical situations. Medical emergencies require a note from an attending physician. If you miss an exam due to an emergency, you must notify the instructor as soon as possible. You can do this in person or by calling and leaving a phone message. Dates for all exams will be posted at least one week in advance. The final exam is scheduled for

10:15 a.m. – 12:15 p.m., Monday, Dec. 15

In no circumstances can the exam be taken early.

**Participation.** Students who do well in this class participate. They attend classes regularly and are never tardy. They pay attention to the lectures and participate in class discussion. They do not disturb those around them. They don’t whisper nor leave for food and other frivolous matters. They turn off cellphones, beepers and alarms on watches. Students can be dropped for inadequate participation. At several points during the drop period, your instructor will count your missing homework and quizzes. If they total to at least three, you will be dropped from the course. All missing work will be counted—even materials collected when you were absent for reasons beyond your control. A Course Information Sheet must be completely filled in and turned in by noon, September 12.

**Graded Material.** Please keep all graded work until you get your final grade. Do not dispose of it if you wish to make a grade appeal. If you believe a quiz, homework or midterm exam was incorrectly graded, please bring your concern forward before December 10.

**Course Content:** We will cover basic definitions in graph theory, long paths and cycles, matchings, domination, colorings, trees and connectivity. Graphical enumeration will be discussed. We will encounter Euler’s formula, Kuratowski’s theorem and the Bondy-Chvatal algorithm.

**Office Hours:**

1-2 MWF
10-11 Tu

Appointments at other times are most welcome. In addition, the instructor has an “open door” policy. If you find the instructor in his office at any time, if at all possible, he will set aside what he is doing and see you then. The instructor feels no obligation to inform you of information passed out in class when you were absent for no good reason.
Audits: A student who audits this course must meet the prerequisite and attend class regularly. An auditing student does not need to take the exams but must turn in all homework and quizzes. A student cannot change this course to an audit if a homework set or quiz is missing. Nor can the course be changed to an audit if the student is making a D or F.

Late Withdrawals and Incomplete. In order to qualify for an incomplete grade or a late withdrawal you will need to be making a C grade or better at the time of application. Incomplete grades and withdrawals will only be given if a major disruption occurs in your life sometime after October 31. Kindly note that rationalizations like, “I will loose my scholarship if I fail this course” are not reasons for a late withdrawal nor incomplete grades. Application for an incomplete or late withdrawal must be made before the final exam is begun. Further information on department grading policies can be found at:

http://www.math.uaf.edu/dms/Policies.html

Late Additions. If you wish to add this class after the first day of class you should come to class and turn in all graded work starting on the first day. You should be on a wait list. If the class is added late, you will not be allowed the opportunity to make up any material that was not turned in. It will be considered late and not graded. The course cannot be added if you are missing three or more graded items.

Disability Needs. If you desire special accommodation as a disabled student, you must inform the instructor during the first week of the semester. Please check with the Disabilities Services at the Campus Health Center before doing so. They will require proper documentation. Your instructor cannot evaluate your medical condition nor make a determination concerning a disability.

A Course Schedule.

Week 0  Preliminaries
Week 1  Section 1.2
Week 2  Section 1.3
Week 3  Chapter 2
Week 4  Sections 3.1, 3.2
Week 5  Sections 3.3, 4.1
Week 6  Sections 4.2,
Week 7  section 5.1
Week 8  Sections 5.2, 5.3
Week 9  Sections 6.1, 6.2
Week 10  Section 6.3, 8.1
Week 11  Section 8.3
Week 12  Section 8.4
Week 13  Section 8.5
Week 14  Review
Week 15  Final Exam

**Big Tip:** Always come to class. Never be late.

Good luck and best wishes for a pleasant and productive course!