CHANGE COURSE (MAJOR) and DROP COURSE PROPOSAL

SUBMITTED BY:

Department: Mathematics and Statistics
Prepared by: Jill Faudree
Email: irfaudree@alaska.edu

College/School: CNSM
Phone: 474-7385
Faculty Contact: Jill Faudree

1. CURRENT COURSE IDENTIFICATION:

   Dept: MATH  Course #: F490  No. of Credits: 1.0
   Title: Senior Seminar

2. ACTION DESIRED:

   Change Course [XXX] If Change, indicate below what changes are being requested.
   Drop Course [ ]

   PREREQUISITES: [XXX]
   CREDITS (including credit distribution): [XXX]
   CROSS-LISTING: Dept. [ ]
   STACKING: (400/600) [ ]
   OTHER (please specify): [ ]

3. COURSE FORMAT

   NOTE: Course hours may not be compressed into fewer than three days per credit. Any course compressed into fewer than six weeks must be approved by the college or school’s curriculum council. Furthermore, any core course compressed to less than six weeks must be approved by the core review committee.

   COURSE FORMAT:
   (check all that apply)
   OTHER FORMAT (specify all that apply)
   Mode of delivery (specify lecture, field trips, labs, etc)

   [ ] 1  [ ] 2  [ ] 3  [ ] 4  [ ] 5  [XXX] 6 weeks to full semester
   [ ] seminar

4. COURSE CLASSIFICATIONS: (undergraduate courses only. Use approved criteria found on Page 10 & 17 of the manual. If justification is needed, attach on separate sheet.)

   H = Humanities  [ ]  N = Natural Science  [ ]  S = Social Sciences  [ ]

   Will this course be used to fulfill a requirement for the baccalaureate core? [XXX]  YES  [ ] NO

   IF YES, check which core requirements it could be used to fulfill:
   O = Oral Intensive, [XXX]  W = Writing Intensive, Format 6 turned in:  [ ]
   Format 7 turned in:  [ ]  Natural Science, Format 8 turned in:  [ ]

5. COURSE REPEATABILITY:

   Is this course repeatable for credit? [ ] YES  [XXX] NO

   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
6. CURRENT CATALOG DESCRIPTION AS IT APPEARS IN THE CATALOG: including dept., number, title and credits

<table>
<thead>
<tr>
<th>MATH F490 O Senior Seminar</th>
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<tbody>
<tr>
<td>1 Credits</td>
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<tr>
<td>Offered Spring</td>
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<tr>
<td>Advanced topics selected from areas outside the usual undergraduate offerings. A substantial level of mathematical maturity is assumed. Prerequisites: COMM F131X or COMM F141X, at least one of MATH F308 or MATH F401. (1+0)</td>
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7. COMPLETE CATALOG DESCRIPTION AS IT WILL APPEAR WITH THESE CHANGES: (Underline new wording strike-through old wording and use complete catalog format including dept., number, title, credits and cross-listed and stacked.) PLEASE SUBMIT NEW COURSE SYLLABUS. For stacked courses the syllabus must clearly indicate differences in required work and evaluation for students at different levels.

<table>
<thead>
<tr>
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8. IS THIS COURSE CURRENTLY CROSS-LISTED?
   YES/NO [NO]    IF Yes, DEPT [ ]    NUMBER [ ]
   (Requires written notification of each department and dean involved. Attach a copy of written notification.)

9. GRADING SYSTEM:
   LETTER: [XX]    PASS/FAIL: [ ]

10. ESTIMATED IMPACT
    WHAT IMPACT, IF ANY, WILL THIS HAVE ON BUDGET, FACILITIES/SPACE, FACULTY, ETC.
    None.

11. LIBRARY COLLECTIONS
    Have you contacted the library collection development officer (ffklj@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.
    [XX] Yes [ ]

12. 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)
Only undergraduate mathematics majors are affected by this change.

13. **POSITIVE AND NEGATIVE IMPACTS**
Please specify positive and negative impacts on other courses, programs and departments resulting from the proposed action.

This change does not impact any other program, department, or course.

14. **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. If you ask for a change in # of credits, explain why; are you increasing the amount of material covered in the class? If you drop a prerequisite, is it because the material is covered elsewhere? If course is changing to stacked (400/600), explain higher level of effort and performance required on part of students earning graduate credit. Use as much space as needed to fully justify the proposed change and explain what has been done to ensure that the quality of the course is not compromised as a result.

Math 490 O is the capstone course for mathematics majors. It has a substantial oral component and is used in departmental assessment. In practice, the instructor has to fit in instruction on an advanced mathematical topic that brings together some of the core subjects in the required math curriculum. This instruction occurs largely through guided student lectures on the topic which requires significantly more time and work for all parties involved than a standard lecture-style course. The degree assessment is an added burden yet this is certainly the course in which to embed such tasks. The department feels that one credit is insufficient to accomplish all of these goals. Some instructors have been forced to schedule many classes outside the regular meeting time in order to satisfy all the demands.

There is also an advantage for our students. Math majors often finish their required coursework a bit short on upper-division credits. Frequently they are 4 credits short which usually means two more courses. This may ease that problem some.

The prerequisite change simply states explicitly the intended purpose of this as a capstone course.

**APPROVALS:**

<table>
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<tr>
<th>Signature, Chair, Program/Department of:</th>
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| Signature of Provost (if applicable) Offerings above the level of approved programs must be approved in advance by the Provost. | Date |

**ALL SIGNATURES MUST BE OBTAINED PRIOR TO SUBMISSION TO THE GOVERNANCE OFFICE.**

<table>
<thead>
<tr>
<th>Signature, Chair, UAF Faculty Senate Curriculum Review or Graduate Academic &amp; Advisory Committee</th>
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**APPROVALS:**

[Signature, Chair, Program/Department of: Math & Stat] Date 2/24/10

[Signature, Chair, College/School Curriculum Council for: CNSM] Date 3/15/10

[Signature, Dean, College/School of: CNSM] Date 3/16/10

Signature of Provost (if applicable) Date

Offerings above the level of approved programs must be approved in advance by the Provost.
### ADDITIONAL SIGNATURES: (If required)

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MATH 490 O: Senior Seminar - $p$-adic Numbers  
Spring 2010

Instructor: Jill Faudree  
Office: 301D Chapman, 474-7385  
E-mail: jrfaudree@alaska.edu  
Office Hours: MW 1-3, and by appointment  
Web page: http://www.dms.uaf.edu/~faudree/M490.html  
Prerequisites: (Math 401 or 405=308) and (Comm 131 or 141)  
Credit Hours: 2.0  
Required Text: $p$-adic Analysis Compared with Real, by Svetlana Katok, Student Mathematical Library, American Mathematical Society  
Class Meetings: MW 4:40-5:40, in Chapman 104  
Final Exam: Thursday, May 13, 10:15-12:15

Course overview and learning outcomes:

The primary purposes of the Senior Seminar is for you to learn to communicate to your peers about advanced mathematics, through both formal oral presentations and informal discussion, and to direct your own mathematical learning. Over the course of the semester, you will lecture to your fellow students, question and discuss with classmates when they present lectures, and in general help each other to learn about a new topic. The instructor will provide guidance throughout the course, and lay out a course structure, but will not be teaching you in the typical lecture format used for most mathematics courses.

The topic for this offering, the $p$-adic numbers, is one that blends ideas from analysis and algebra, and hence builds on ideas from the prerequisite courses. While not a part of the standard undergraduate curriculum, it is a good topic to help you relate different parts of your major and see how ideas you've been exposed to in other courses can lead to entirely new topics. The ability to deal with abstract mathematical concepts that you have developed in upper-level mathematics courses will also be put to use.

While there is a minimal amount of material that the course will definitely cover, the pace will be in part determined by the students. When learning new mathematical material in a seminar format, it is easy to go too slowly, in an effort to make sure you understand every detail. Usually, however, it is better to forge ahead, recognizing that later material will help you get a deeper understanding of earlier topics. This can be dangerous however, if you allow yourself to slide over difficult issues without working hard to understand them. The instructor's roles will include monitoring the pace of the class, probing to make sure all students are engaging with the material, and offering perspectives that may not emerge from class discussions.
Mechanics of the course:

Most class meetings will be lead by a pair of students who are assigned this responsibility in advance. All students should come to class having read the relevant section of the text, but the leaders should have already spent significant effort to master the material.

The class leaders should each give a 20-25 minute lecture covering their portion of the assigned section. Each presentation should have a beginning, middle, and end and should use appropriate visual media. The presentations need not include everything in the text, but rather emphasize whatever is most important. You will have to use your judgement and determine the main points of the section, giving important definitions, proofs, and examples. Leaders may meet with the instructor ahead of time for advice or help, but this is not required.

Other students should ask questions, and contribute comments in class. If enough discussion results, this may take the entire class meeting time.

If time is left over, homework problems will be discussed. Class leaders do not have special responsibility to have solutions to all homework, but will moderate homework discussions. This includes having students present solutions or partial solutions, helping isolate difficult points, and leading the class in formulating questions for the instructor.

Each week, the instructor will assign a few homework problems for all students to complete by the next class. Students may work on these problems with classmates, but the work turned in must be written individually. Grades on homework will be based on both correctness and quality of presentation using good mathematical style.

Teams of class leaders will rotate, so that you are paired with different classmates over the course of the semester.

In the first class meeting, we will discuss the process of writing and delivering a good mathematics lecture. Also, every student will receive a written evaluation from the instructor within a week of giving a presentation. This evaluation will include strengths and weakness of the presentation and suggestions for improvement. Each student can expect to give at least two presentations.

Class attendance and participation is required, and forms a significant part of your grade. If you must miss class for unavoidable reasons, you should inform the instructor of the reason in advance, if possible.

Homework problems will be assigned in each class, and collected in the following one. Assignments are due in class, and will not be accepted late except in serious extenuating circumstances.

I encourage you to work with others on the homework, but you must write up solutions independently. You will learn nothing from simply copying someone's solution. The best approach is 1) make a first attempt at all problems alone, 2) meet with a classmate to work out difficult issues, 3) write up complete solutions alone.

There will be a final examination on the course material which will be part of your grade.
In addition, the department requires that seniors take a standardized Mathematics Field Test to gain data on the effectiveness of our major. Taking this test is required to pass the course, but your performance on it will not affect your grade in the seminar. This exam will be scheduled later in the semester, outside of scheduled class meetings.

**Grades:**

You must take the Mathematics Field Test to pass this course, but your score on that test will not affect your course grade.

You must achieve a passing grade on the final examination to pass the course. If you do pass the final, then your grade will be based on 30% homework, 35% class presentations, 10% other class participation, 25% final examination. Your grades on class presentations will be based on organization and choice of material to present, clarity of oral expression and blackboard use, and your success in engaging and being responsive to the audience. Your homework grade includes correctness of solutions and clarity of presentation.

Course grades will be determined according to the following cutoffs:

\[
A \geq 90\%, \\
B \geq 80\%, \\
C \geq 70\%, \\
D \geq 60\%.
\]

The top 3 points of each grade range will receive a ‘+’, and the bottom 3 points a ‘-’.

Note that you are not in competition with your peers – everyone in the class may get an A+, or everyone may get an F.

**University and Department Policies:**

Your work in this course is governed by the UAF Honor Code. The Department of Mathematics and Statistics has specific policies on incompletes, late withdrawals, and early final exams which can be found at [http://www.dms.uaf.edu/dms/Policies.html](http://www.dms.uaf.edu/dms/Policies.html).

**Disabilities:**

If you have any disabilities that I should know about, you should bring them to my attention soon so that we can work with the Office of Disability Services to set up any necessary accommodations.

**Speaking Center:**

The UAF Speaking Center offers coaching and practice to prepare for oral presentations. It is located at 507 Gruening, with spring semester hours MW 11-3, R1-3, MTW 5:30-8:30. Call 474-5470 to schedule an appointment, or simply walk in.
(Very) Tentative Schedule

Week 1  Jan. 25 – 31  Introduction/Lecture Practices
Week 2–3  Feb 1 – Feb. 10  Chapter 1 Sections 1,2
Week 4–6  Feb. 15 – March 3  Chapter 1 Section 3,4, Chapter 2 Sections 1,2

SPRING BREAK

Week 7–8  March 15 – March 24  Chapter 2 Sections 3,4
          MIDTERM EXAM – March 24
Week 9–12  March 29 – April 21  Chapter 3
Week 13–14  April 26 – May 5  Mathematics Field Test, Exit Survey, selected
topics from Chapter 4(if time permits)

FINAL EXAM – May 10