Please check one: ☑ New course  ☐ Revised course

PART I: CATALOG DESCRIPTION

1. Course prefix and number, such as ART 1000: MAT 4345
2. Title (may not exceed 30 characters, including spaces): Topics in Applied Mathematics
3. Long title, if any (may not exceed 100 characters, including spaces):
4. Class hours per week, lab hours per week, and credit [e.g., (3-0-3)]: 3-0-3
5. Term(s) to be offered: ☐ Fall  ☐ Spring  ☐ Summer  ☑ On demand
6. Initial term of offering: ☐ Fall  ☑ Spring  ☐ Summer  Year: 2011
7. Course description (not to exceed four lines): Selected topics in applied mathematics. Topics may vary depending on student and faculty interests. May be repeated for credit, with change of topic for a maximum of 6 credits.
8. Registration restrictions:
   a. Identify any equivalent courses (e.g., cross-listed course, non-honors version of an honors course). none
   b. Prerequisite(s), including required test scores, courses, grades in courses, and technical skills. Indicate whether any prerequisite course(s) MAY be taken concurrently with the proposed/revised course. Permission of the instructor.
   c. Who can waive the prerequisite(s)? ☐ No one  ☐ Chair  ☑ Instructor  ☐ Advisor  ☐ Other (Please specify)
   d. Co-requisites (course(s) which MUST be taken concurrently with this one): none
   e. Repeat status: ☐ Course may not be repeated. ☑ Course may be repeated to a maximum of 6 hours or 2 times.
   f. Degree, college, major(s), level, or class to which registration in the course is restricted, if any: none
   g. Degree, college, major(s), level, or class to be excluded from the course, if any: none
9. Special course attributes [cultural diversity, general education (indicate component), honors, remedial, writing centered or writing intensive]
10. Grading methods (check all that apply): ☑ Standard letter  ☐ C/NC  ☐ Audit  ☐ ABC/NC (“Standard letter”—i.e., ABCDF--is assumed to be the default grading method unless the course description indicates otherwise.)
11. Instructional delivery method: ☑ lecture  ☐ lab  ☐ lecture/lab combined  ☐ independent study/research  ☐ internship  ☐ performance  ☐ practicum or clinical  ☐ study abroad  ☐ other
PART TWO: ASSURANCE OF STUDENT LEARNING

1. List the student learning objectives of this course: This course is designed to provide students with an opportunity to study advanced applied mathematics. Specific objectives will vary from topic to topic but students will always be required to think critically and write effectively.

   a. If this is a general education course, indicate which objectives are designed to help students achieve one or more of the following goals of general education and university-wide assessment:
      - EIU graduates will write and speak effectively.
      - EIU graduates will think critically.
      - EIU graduates will function as responsible citizens.

   b. If this is a graduate-level course, indicate which objectives are designed to help students achieve established goals for learning at the graduate level:
      - Depth of content knowledge
      - Effective critical thinking and problem solving
      - Effective oral and written communication
      - Advanced scholarship through research or creative activity

2. Identify the assignments/activities the instructor will use to determine how well students attained the learning objectives:
   Assignments will vary based on topic. In a Sample Topic "Mathematical Modeling," these would likely involve homework assignments, in-class tests, computer assignments using a spreadsheet and/or computer algebra system and/or a programming or scripting language, and a group project.

3. Explain how the instructor will determine students’ grades for the course:
   Evaluation may be done via exams, problem sets and/or projects. In the Mathematical Modeling sample course this would be homework and test grades, project report presentation, along with a final exam.

4. For technology-delivered and other nontraditional-delivered courses/sections, address the following:
   a. Describe how the format/technology will be used to support and assess students’ achievement of the specified learning objectives:
   b. Describe how the integrity of student work will be assured:
   c. Describe provisions for and requirements of instructor-student and student-student interaction, including the kinds of technologies that will be used to support the interaction (e.g., e-mail, web-based discussions, computer conferences, etc.):

5. For courses numbered 4750–4999, specify additional or more stringent requirements for students enrolling for graduate credit. These include:
   a. course objectives;
   b. projects that require application and analysis of the course content; and
   c. separate methods of evaluation for undergraduate and graduate students.

6. If applicable, indicate whether this course is writing-active, writing-intensive, or writing-centered, and describe how the course satisfies the criteria for the type of writing course identified. (See Appendix *.)
PART III: OUTLINE OF THE COURSE

Provide a week-by-week outline of the course’s content. Specify units of time (e.g., for a 3-0-3 course, 45 fifty-minute class periods over 15 weeks) for each major topic in the outline. Provide clear and sufficient details about content and procedures so that possible questions of overlap with other courses can be addressed. For technology-delivered or other nontraditional-delivered courses/sections, explain how the course content “units” are sufficiently equivalent to the traditional on-campus semester hour units of time described above.

For the sample course Mathematical Modeling, the outline would look like:

1. Mathematical Modeling -- An Introduction (1 week)
2. Discrete Models -- Difference Equations (4 weeks)
3. Continuous Models -- Differential Equations (4 weeks)
4. Probabilistic Models -- Simulations, Markov Chains (3 weeks)
5. Optimization -- Voting, Apportionment, Game Theory (3 weeks)

PART IV: PURPOSE AND NEED

Explain the department’s rationale for developing and proposing the course.

1. There are many advanced applied mathematics topics which, due to the size of our program, cannot be offered on a regular basis. This proposed course offers a vehicle for offering instruction in these topics as the need and interest arises.
   a. If this is a general education course, you also must indicate the segment of the general education program into which it will be placed, and describe how the course meets the requirements of that segment.
   b. If the course or some sections of the course may be technology delivered, explain why.

2. Justify the level of the course and any course prerequisites, co-requisites, or registration restrictions.
   The topics will be appropriate for advanced undergraduates. The prerequisites will vary and will be determined by the instructor.

3. If the course is similar to an existing course or courses, justify its development and offering.
   This course is similar to 4335, Undergraduate Topics. See 3b.
   a. If the contents substantially duplicate those of an existing course, the new proposal should be discussed with the appropriate chairpersons, deans, or curriculum committees and their responses noted in the proposal.
   b. Cite course(s) to be deleted if the new course is approved. If no deletions are planned, note the exceptional need to be met or the curricular gap to be filled. The departmental goal is to have a topics course in each of mathematics, applied mathematics, and computer science. It may be that a topic, for example, would be useful for both applied mathematics and computer science majors so would be cross listed under both numbers.
   The title of MAT 4335 would be changed to "Topics in Mathematics."

4. Impact on Program(s):
   a. For undergraduate programs, specify whether this course will be required for a major or minor or used as an approved elective. It would be an approved elective.
b. For graduate programs, specify whether this course will be a core requirement for all candidates in a degree or certificate program or an approved elective.

If the proposed course changes a major, minor, or certificate program in or outside of the department, you must submit a separate proposal requesting that change along with the course proposal. Provide a copy of the existing program in the current catalog with the requested changes noted.

PART V: IMPLEMENTATION

1. Faculty member(s) to whom the course may be assigned: Margaret Weaver, Kamlesh Parwani, William Perry, Leo Comerford and others

If this is a graduate course and the department does not currently offer a graduate program, it must document that it employs faculty qualified to teach graduate courses.

2. Additional costs to students: none

Include those for supplemental packets, hardware/software, or any other additional instructional, technical, or technological requirements. (Course fees must be approved by the President’s Council.)

3. Text and supplementary materials to be used (Include publication dates): Materials will vary with the topic but will usually consist of a standard textbook supplemented by photocopied articles.

PART VI: COMMUNITY COLLEGE TRANSFER

If the proposed course is a 1000- or 2000-level course, state either, "A community college course may be judged equivalent to this course" OR "A community college course will not be judged equivalent to this course." A community college course will not be judged equivalent to a 3000- or 4000-level course but may be accepted as a substitute; however, upper-division credit will not be awarded. A community college course will not be judged equivalent to this course.

PART VII: APPROVALS

Date approved by the department or school: January 11, 2010

Date approved by the college curriculum committee: January 29, 2010

Date approved by the Honors Council (if this is an honors course):

Date approved by CAA: February 18, 2010