Request for Courses in the Core Curriculum

Originating Department or College: Engineering, Mathematics, and Physics/ College of Arts and Sciences

Person Making Request: Dr. Weam M. Al-Tameemi

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Course Number and Title: MATH 2412 – PRECALCULUS

Please attach in separate documents:
___ Completed Catalog Add/Change Form
_x_ Syllabus

List the student learning outcomes for the course (Statements of what students will know and/or be able to do as a result of taking this course. See appended hints for constructing these statements.)

Upon successful completion of this course, the students will be able to:
1. Set up and solve polynomial, rational, radical, exponential, and logarithmic equations and inequalities of one variable, and systems of linear and non-linear equations with two or more variables.
2. Sketch the graphs of equations and inequalities.
3. Perform operations with complex numbers and matrices to apply them to solve problems. Use the Polar from and D'Moivre's formula to compute the n-th root of a complex number.
4. Compute the general term of arithmetic and geometric sequence and the sum of its terms, and perform the expansion of a positive integer power of a binomial.
5. Identify functions from algebraic, graphical, tabular, and verbal expressions and apply them to solve problems.
6. Recall the definition of the six basic trigonometric functions: sine, cosine, tangent, cotangent, secant, cosecant, as well as their basic periodicity properties, graphs and symmetries, and identify and use their inverse trigonometric functions, together with their domains and graphs, to solve trigonometric equations.
7. Verify trigonometric identities and their relative relationships, such as use the value of the trigonometric function of an angle to compute the value of a trigonometric function of the same angle, or double that angle, or half that angle;
8. Use vectors and trigonometry concepts to solve problems related to geometry using the sine and cosine laws, or to solve problems related to parametric equations or polar coordinates and physics; and
9. Prepare and submit a final paper using phrases commonly found in mathematical literature.

Component Area for which the course is being proposed (check one):

___ Communication
_x_ Mathematics
___ Language, Philosophy, & Culture
___ Creative Arts
___ Life & Physical Sciences
___ American History
___ Government/Political Science
___ Social & Behavioral Science
___ Component Area Option

Competency areas addressed by the course (refer to the appended chart for competencies that are required and optional in each component area):

_x_ Critical Thinking
_x_ Communication Skills
  _x_ Written Communication
  ___ Oral Communication
  ___ Visual Communication
_x_ Empirical & Quantitative Skills
___ Teamwork
___ Personal Responsibility
___ Social Responsibility

Because we will be assessing student learning outcomes across multiple core courses, assessment assigned in your course must include assessment of the core competencies. For each competency checked above, indicate the specific course assignment(s) which, when completed by students, will provide evidence of the competency. Provide detailed information,

such as copies of the paper or project assignment, copies of individual test items, etc. A single assignment may be used to provide data for multiple competencies.

Critical Thinking: This course is designated to enhance student's critical thinking in mathematics through their creative thinking, innovation, analysis, evaluation, and synthesis of information (SLO's 1, 2, 3, 4, 5, 6, & 7).

Critical thinking is defined as an intellectually disciplined process of actively and skillfully conceptualizing, applying, and/or analyzing information gathered from observation, reflection, reasoning, or communication.

Students will take five quizzes throughout the semester. These quizzes will include problems that require critical thinking skills. Students will also be provided an opportunity to develop a final paper. Although topics vary by student interest, all students must compose a thesis-driven final paper based on a mathematical concept discussed in class. The paper must demonstrate overall knowledge and a real-world application of the topic. The paper must be effectively structured and supported with examples and data as needed.

The rubric domains that will be utilized are: focus, organization & development, and research. Emphasis will be on the critical thinking aspects of "creativity, innovation, inquiry, and analysis, evaluation, and synthesis of information."

Communication Skills: In the same above work, students will demonstrate their ability to communicate effectively by using written communication (SLO's 8 & 9).

Written communication will be emphasized under this category which includes a final paper. This final paper could be digitally submitted for core-curriculum assessment.

Students will be required to write this paper on their experiences in the course by citing various concepts they learned through their regular class attendance. The paper is to be 5 pages (not including a works cited page), double spaced, 12 Times New Roman font size, and APA formatted. As this final paper is in progress, the students will be required to make frequent visits (at least 3) to the University Writing Center to get assistance on local and global writing issues. Each visit will need to be documented using the referral form. A concise summary of the analysis is presented in the paper. The final paper will be submitted to the course instructor during the last week of the semester. These papers will be graded using a communication skills rubric with a focus on writing for core-curriculum evaluation.

Empirical and Quantitative Skills: This course will provide empirical and quantitative skills that include the manipulation and analysis of numerical data or observable facts resulting in informed conclusions. (SLO's 8 & 9).

The quizzes will also have the focus on quantitative literacy in logic, patterns, and relationships that involve the understanding of key mathematical concepts and the application of appropriate quantitative tools to everyday experiences. By doing so, informed conclusions can be drawn from the manipulation and analysis of numerical data or observable facts.

Students will be evaluated on their ability to consider different perspectives and to work effectively to support the argument and purpose. The information found in the quizzes is required for an analysis of all components and should be clearly understood by students. If applicable, values are correctly translated into variables and all necessary formulas are presented. The steps followed must be logical and relevant to the intended result. Any notation for its consistency will be ascertained. The investigation should lead to an accurate, complete, subject-specific and relevant conclusion related to the initial inquiry.

Will the syllabus vary across multiple sections of the course? ___ Yes _x_ No
If *yes*, list the assignments that will be constant across the sections:

Inclusion in the core is contingent upon the course being offered and taught at least once every other academic year. Courses will be reviewed for renewal every five (5) years.

The department understands that instructors will be expected to provide student work and to participate in university-wide assessments of student work. This could include, but may not be limited to, designing instruments such as rubrics, and scoring work by students in this or other courses. In addition, instructors of core courses may be asked to include brief assessment activities in their courses.

Reviewed and approved by the Core Curriculum Committee on February 1, 2013.