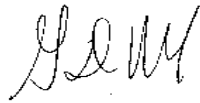Recommendation 2012-05: UNIVERSITY SENATE RECOMMENDATION TO THE PROVOST
The University Senate recommends approval of MATH 1117, as per the report from the Colonnade
Implementation Committee in its December 2012 report.

Approved 12/14/2012

MATH 117 General Education Proposal

1. **A sample syllabus for this course. See attached**

2. **Statement of how your course meets the Colonnade Plan's learning objectives.**

Course Description: MATH 17: Trigonometry (3 hours) meets the five learning objectives included in the Quantitative Reasoning section of the Colonnade Plan. Students in Math 117 will be able to apply knowledge of the unit circle; trigonometric functions and graphs; trigonometric identities and equations; right triangle trigonometry; laws of sines and cosines; DeMoivre's Theorem; vectors and applications of trigonometry. Further, students will learn to model and solve problems appropriate for the field of study in majors of the sciences. Students with a Math ACT of 26 or higher will receive 3 hours credit for this requirement.

MATH 117 specifically meets the five learning objectives as detailed below:

Learning Objective 1: Interpret information presented in mathematical forms.

Students in MATH 117 learn to interpret information presented in mathematical form by learning to angle measures to model real-life problems.

More specifically, students in Math 117 will learn to interpret:

- the relationship between radian and degree measures of angles
- describe a variety of angles
- analyze the graphical representation of a trigonometric functions
- the domain and period of trigonometric functions
- identities to rewrite and/or simplify expressions
- use a variety of formulas to evaluate trigonometric expressions

Learning Objective 2: Illustrate and communicate mathematical information symbolically, visually and/or numerically.

Students in MATH 117 learn to illustrate and communicate mathematical information symbolically by learning when and how to use a mathematical expression, equation or function to express quantitative information.

More specifically, students in Math 117 will be able to:

- identify the unit circle and describe is relationship to real numbers
- graph the trigonometric functions including inverse functions
- communicate domain, period, amplitude, and phase shifts of the graphs of trigonometric functions
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Learning Objective 3: Determine when computations are needed and execute the appropriate computations.

Students in MATH 117 learn to determine when computations are needed and execute the appropriate computations through exercises that develop skills in carrying out procedures accurately and efficiently to solve problems.

More specifically, students in Math 117 will learn through the use of homework to:

- convert between degrees and radians
- evaluate trigonometric functions using the unit circle
- evaluate trigonometric functions using any angle
- find and evaluate reference angles
- use an appropriate calculator to evaluate trigonometric functions
- use identities and algebra to solve trigonometric functions and their inverses

Learning Objective 4: Apply an appropriate model to the problem to be solved.

Students in MATH 117 learn to apply an appropriate model to the problem to be solved via exercises designed to teach recognition of angles, motion, landscaping, and bearings and to develop skill in performing such applications.

More specifically, students in Math 117 will be able to apply:

- appropriate models of for using right triangles
- appropriate model of directional bearings
- appropriate models of harmonic motion
- appropriate models for projectile motion

Learning Objective 5: Make inferences, evaluate assumptions, and assess limitations in estimation modeling.

Students in MATH 117 learn to make inferences, evaluate assumptions and assess limitations in estimation modeling via application exercises from meteorology, surveying, engineering, physical therapy, and biology which require imposing "real-world" assumptions and/or limitations on procedures selected and inferences made from results.

More specifically, students in Math 117 will learn to:

- use and approximate the modeling of error analysis in a variety of functions

Brief description of how your department will assess this course's effectiveness.

For MATH 117, assessment will occur at the end of the semester. To assess the course objectives, each student will complete a problem that addresses the five learning objectives. A committee of at least three faculty members will select a sample and evaluate the common assessment problem that addresses the skills and concepts as stated in the learning outcomes. The committee will randomly collect 25% to 30% of the sample across all sections of MATH 117 to help assess students' mastery of the learning outcomes. The following criterion will be used to assess student learning outcomes:

Each test question will be scored on scale of 0 to 5, using a scoring guide developed by the committee in conjunction with the department. A common rubric (5 -Excellent ; 4 - Good; 3 - Satisfactory; 2 - Poor; 0 and 1- Fail).

The goals will be as follows:

Satisfactory = at least 70% of students scored 3 or better

Unsatisfactory = under 70% of students scored 3 or better

- **If necessary, a list of any proposed revisions needed to bring your course in line with the Colonnade Plan.**

MATH 117 will be re-evaluated at the end of each academic year to determine if the learning objectives are being met, and will be updated accordingly.

Sample Syllabus

Math 117 Trigonometry

TEXT : Trigonometry, 8th Edition, 2011 by Larson with WebAssign

Course Description: MATH 117: Trigonometry (3 hours) meets the five learning objectives included in the Quantitative Reasoning section of the Colonnade Plan. Students in Math 117 will be able to apply knowledge of the unit circle; trigonometric functions and graphs; trigonometric identities and equations; right triangle trigonometry; laws of sines and cosines; DeMoivre's Theorem; vectors and applications of trigonometry. Further, students will learn to model and solve problems appropriate for the field of study in majors of the sciences.

COURSE OUTLINE : Chapter P (Section P.3 only) through Chapter 6 (Sections 6.6, 6.7 and 6.8 only).

PREREQUISITIES : 1) College Algebra (Math 116 or Math 116E) with a grade of C or better, 2) 4 years of high school math from the pre-college curriculum, AND either a) MPE of 18 or better, b) or a Math ACT score of 22 and a GPA of 3.0 in high school math.

CALCULATOR : A graphing calculator is required for this course. A TI-83 or TI-84 is recommended.

ATTENDANCE : You will be asked to sign a paper for attendance in each class time. If you miss more than 3 class times without any excuse note, your grade for this course will be dropped one letter grade below.

HOUR TESTS: There will be 4 (100 points) hour tests throughout the semester, each announced well in advance. **Missing an hour test is a serious matter, and make-up test will be arranged only under the most extenuating circumstances provided the instructor is informed in advance.** Tests are closed book. In general, they will contain problems selected from similar to homework assignments, lecture examples and book examples, so it is to your advantage to do the homework, attend class and to read the book.

HOMEWORK: Homework problems will be assigned weekly through WebAssign. Approximately 10 or 12 homework assignments will be assigned throughout this semester. Please read the instructions below to sign in.

QUIZZES : 8-10 minutes-quiz will be given once a week. No make-up will be given unless you have an official document which proves your excuse.

FINAL EXAM: A comprehensive exam will be given on Thursday (Dec 13, 2012) 8:00am – 10:00am.

GRADES: Your final grade for this course is going to be calculated using the following percentage table.

Homework and Quizzes	40%
Hour Tests	40%
Final Exam	20%
Total	100%

Grading Scale:

90-100 A, 80-89 B, 70-79 C, 60-69 D, 59 and below F.

DISABILITY : In compliance with university policy, students with disabilities who require accommodations (academic adjustments and/or auxiliary aids or services) for this course must contact the Office for Student Disability Services in DUC A-200 of the Student Success Center in Downing University Center.

MATH LAB : Math Lab is located in the floor 2R which is a floor between 2_{nd} and 3_{rd} floors. Room number is COHH 2124.

IF YOU WANT TO GET FULL CREDIT FOR ANY GRADED WORK, I ENCOURAGE YOU TO SHOW ALL YOUR WORK.