**Course Approval Form**

For approval of new courses and deletions or modifications to an existing course.

registrar.gmu.edu/facultystaff/curriculum

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**Action Requested:**
- [X] Create new course
- Modify existing course (check all that apply)
  - Title
  - Prereq/coreq
  - Credits
  - Schedule Type
  - Repeat Status
  - Restrictions
  - Grade Type

**Course Level:**
- Undergraduate
- Graduate

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**College/School:** INTO Mason

**Department:**

**Subject Code:** MATH

**Number:** 045

**Effective Term:**
- [X] Fall
- [X] Spring
- Year 2016

**Title:**
- Current Banner (30 characters max including spaces) STEM Math Prep
- New STEM Math Preparation

**Units:**
- Fixed 0 or Variable to

**Grade Mode:**
- (check one)
  - Regular (A, B, C, etc.)
  - Satisfactory/No Credit
  - Special (A, B, C, etc. +IP)
  - Special (English Language)

**Repeat Status:**
- Not Repeatable (NR)
- Repeatable within degree (RD)
- Repeatable within term (RT)

**Schedule Type:**
- Lecture (LEC)
- Recitation (RCT)
- Lab (LAB)
- Internship (INT)

**Prerequisite(s):**
- AE Level 3 Core
- AE Level 3 OCS
- or admission to an INTO Mason Pathway program

**Corequisite(s):**

**Restrictions Enforced by System:**
- Major, College, Degree, Program, etc. Include Code.

**Must be enrolled in college “INTO Mason”**

**Catalog Copy for NEW Courses Only** (Consult University Catalog for models)

**Description** (No more than 60 words, use verb phrases and present tense)

This course prepares INTO Mason students for Math 113 Calculus with Analytic Geometry I, which is required by the Science and Engineering & Computing Pathways. The course will provide an early exposure to college level mathematics, will prepare students to engage with the language – vocabulary and written/oral comprehension – of mathematics, and will facilitate the transition to a conventional mathematics classroom environment.

**Notes** (List additional information for the course)

The successful completion of this course will either:
- Serve as a prerequisite for Math 105 Pre-Calculus in lieu of the Math Placement Test or
- Prepares the student to achieve the necessary score on the Math Placement Test for entry into Math 113.

**Indicate number of contact hours:** Hours of Lecture or Seminar per week: 2

**When Offered:** (check all that apply)
- [X] Fall
- [X] Summer
- [X] Spring

**Instructional Mode:**
- 100% face-to-face
- Hybrid: ≤ 50% electronically delivered
- 100% electronically delivered

**Are there equivalent course(s)?**
- [X] Yes
- No

If yes, please list MATH 008

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**Approval Signatures**

**Department Approval**

**Date**

**College/School Approval**

**Date**

If this course includes subject matter currently dealt with by any other units, the originating department must circulate this proposal for review by those units and obtain the necessary signatures prior to submission. Failure to do so will delay action on this proposal.

**Unit Name**

**Unit Approval Name**

**Unit Approver’s Signature**

**Date**

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**For Graduate Courses Only**

**Graduate Council Member**

**Provost Office**

**Graduate Council Approval Date**

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**For Registrar Office’s Use Only:** Banner Catalog

(revised 11/8/11)
FOR ALL COURSES (required)
Course Number and Title:
    Math 045 STEM Math Prep

Date of Departmental Approval:
    9/17/15

FOR NEW COURSES (required if creating a new course)
Reason for the New Course:
    INTO Mason students are often not permitted by their sponsors to take courses in an online format. Currently the only program to prepare students for Math 105 PreCalculus is the non-credit course, Math 008, offered exclusively in an online format. This new course also provides an opportunity to give students whose first language is not English, some early exposure to the language and symbols of Mathematics in a non-credit and sheltered setting.

- Relationship to Existing Programs:
    The existing programs, Academic English and INTO Mason Pathways, do not offer courses for this purpose. These will the first.

- Relationship to Existing Courses:
    The content level of Math 045 will exceed that of Math 008. The course will provide a strong foundation for INTO Mason students entering STEM degree programs. Unlike Math 008, Math 045 will include language support and some focus on skills necessary for success in traditional university level Mathematics courses.

- Semester of Initial Offering:
    Spring 2016

- Proposed Instructors:
    Michael Coleson

- Insert Tentative Syllabus Below - See attached syllabus
Overview

Prepares students for Math 113 Calculus with Analytic Geometry I, which is required by the Science, Engineering and Computing Pathways. The course will provide an early exposure to college level mathematics, will prepare students to engage with the language – vocabulary and written/oral comprehension – of mathematics, and will facilitate the transition to a conventional mathematics classroom environment.

The successful completion of this course will either:
- Serve as a prerequisite for Math 105 Pre-Calculus in lieu of the Math Placement Test or
- Prepare the student to achieve the necessary score on the Math Placement Test for entry into Math 113.

Course Materials

- XYZHomework.com: an online homework system that accompanies the textbook

Content

The course will cover both Algebraic and Transcendental functions, laying a solid foundation for the study of Calculus with Analytic Geometry. The Learning Modules for the course are listed below:

1. Linear Equations and Inequalities
2. Graphs of Equations, Inequalities and Functions
3. Systems of Equations
4. Exponents and Polynomials
5. Rational Expressions and Equations
6. Rational Exponents and Radicals
7. Quadratic Equations and Functions
8. Exponential and Log Functions
9. Trigonometry

Grading

In addition to three tests and a final exam, there will be graded quizzes and/or in-class group assignments throughout the semester. Online homework will be assigned for practice.

COURSE SEQUENCE

Module 1
1.1 Linear Equations in one variable
1.2 Using Formulas
1.3 Interval Notation and Linear Inequalities
1.4 Compound Inequalities
1.5 Absolute Value Equations
1.6 Absolute Value Inequalities
1.7 Graphs of Equations
1.8 Introduction to Functions

Module 2
2.1 Function Notation
2.2 Algebra with Functions
2.3 Slope and average rate of change
2.4 Linear Functions
2.5 Linear Inequalities

Module 3
3.1 Solving Systems Of Linear Equations
3.2 Applications of Systems of Linear Equations
3.3 Solving Systems Of Linear Inequalities

Module 4
4.1 Adding and Multiplying Polynomials
4.2 Greatest Common Factor and Factoring by Grouping
4.3 Factoring Trinomials
4.4 Special Products

Module 5
5.1 Reducing Rational Expressions
5.2 Multiplying and Dividing Rational Expressions
5.3 Addition and Subtraction
5.4 Complex Rational Expressions
5.6 Rational Equations

Module 6
6.1 Rational Exponents
6.2 Simplifying Radicals
6.3 Addition and Subtraction of Radicals
6.4 Multiplying and Dividing Radicals
6.6 Radical Equations and Functions

Module 7
7.1 Completing the Square
7.2 The Quadratic Formula
7.3 The Discriminant and Multiplicity
7.4 Graphing Quadratic Functions
7.5 Quadratic Inequalities

Module 8
8.1 Exponential Functions
8.2 Inverse Functions
8.3 Logarithmic Functions
8.4 Properties of Logs

Module 9
9.1 Angles, Degrees and Special Triangles
9.2 Trigonometric Functions