## Course Approval Form

## Action Requested:



Create new course Modify existing courseTitle
Prereq/coreq Other:
 Credits
Schedule Type
 Repeat Status Restrictions

## Course Level:

$\square$ Undergraduate
Graduate


## Prerequisite(s):

Corequisite(s):
Instructional Mode:

| AE Level 3 Core <br> AE Level 3 OCS <br> or admission to an INTO Mason Pathway <br> program |  |
| :--- | :--- |
| Restrictions Enforced by System: Major, College, Degree, Program, etc. Include Code. |  |

x 100\% face-to-face Hybrid: $\leq 50 \%$ electronically delivered 100\% electronically delivered
Restrictions Enforced by System: Major, College, Degree, Program, etc. Include Code.
Are there equivalent course(s)?
Must be enrolled in college "INTO Mason"
x Yes $\quad \square$ No If yes, please list MATH 008
Catalog Copy for NEW Courses Only (Consult University Catalog for models)
Description (No more than 60 words, use verb phrases and present tense) $\quad$ Notes (List additional information for the course)
This course prepares INTO Mason students for Math 113 Calculus $\quad$ The successful completion of this course will either: 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.

Indicate number of contact hours:
Hours of Lecture or Seminar per week:
2
Hours of Lab or Studio:
When Offered: (check all that apply)
Fall $x$ Summer $x$ Spring

## 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 |
| :--- | :--- | :--- | :--- |
|  |  |  |  |
|  |  |  |  |

## For Graduate Courses Only

Graduate Council Member

## Provost Office

Graduate Council Approval Date

## Course Proposal Submitted to the College of Science Curriculum Committee (COSCC)

The form above is processed by the Office of the University Registrar. This second page is for the COSCC's reference.
Please complete the applicable portions of this page to clearly communicate what the form above is requesting.

## 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


## MATH 045: STEM Math Preparation

## 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

- Intermediate Algebra: Concepts with Applications, by Charles P. McKeague, XYZ Textbooks, 2012. The textbook is available in hardcopy or e-text.

ISBN: 978-1-936368-06-8

- 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
5.4Complex 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


