COURSE SELECTION INFORMATION

This course selection information describes your choices for Fundamental Mathematical Concepts (FMC) Topics and Mathematics Workshops. The directions below will take you step-by-step through the choices you will be making. Indicate your preferences on the accompanying Selection Form, which you should **return to us as soon as possible**, as workshop assignments will be made on a first come/first served basis.

FIRST: Read these FMC topic descriptions
Choose a topic from one of the four areas in mathematics listed below. This will be your focus in mathematics for the program. Whatever topic you choose, remember that the goal of SummerMath is to develop your ability to learn deeply and to become a flexible problem solver. Please read the descriptions carefully.

Topic Titles:

- **Algebra**
- **Geometry**
- **Trigonometry**
- **Precalculus to Calculus**

Topic Descriptions

Algebra:
In this area the focus will be on the meaning and uses of the concept of variable. Beginners will construct variable expressions to fit real world situations, learn to construct different representations of a variable algebraic object, and solve equations. More advanced students will do some of the same kinds of investigations with more complex objects and will consider algebra from a functional perspective.

Geometry:
The emphasis in the geometry topic area is on investigating, constructing, and reasoning about geometric objects. You'll learn about the tools of geometry: ruler, compass, paper folding, and the geometry software, Geometer's Sketchpad. These tools will be used to study similarity, congruence, transformations, and more. Choose this topic area only if you have **not** had a high school geometry course.

Trigonometry:
This topic emphasizes modern and ancient applications of triangle trigonometry and the trigonometric functions. Although this focus area may seem fairly specialized, it is a great way to link geometry and algebra and to experience the function concept. Choose this area only if you are fairly fluent in algebra.

Precalculus to Calculus:
The emphasis here is on the idea of function. In precalculus, you'll think about functions graphically, numerically, symbolically, and verbally. If time permits, you will experience the beginnings of calculus by looking at rates of change, which leads to differential calculus. Choose this area only if you are fluent in algebra.

SECOND: Make the FMC choice and mark your choice on the Course Selection Form

Note: Please contact us if you have any difficulty in choosing a topic focus, or if you have any questions. We would be happy to work with you on making your choice. Since we want your time to be directed, focused, and productive, we do expect you to stick with your choice once you enter the program, though you should always talk things over with any of us --- teachers or directors --- at any point that you feel things are not working out the way you would like.

For algebra, trigonometry, and precalculus to calculus, we will use TI-83 + graphing calculators, which are provided by the program for SummerMath classroom use. *The Geometer's Sketchpad* software will be used in geometry and trigonometry.

THIRD: Read these Workshop descriptions

Workshop Set #1: June 30 – July 11:

Digital Photography-- Have you ever had trouble telling a story through written language? Learn to take a photograph like a professional and tell your story! This is an introduction to the basic principles of photography through digital imagery. The course involves working with computers in the "the digital darkroom", but the digital camera is your optimal tool. You will learn basic modes of Adobe Photoshop and effective concepts in visual storytelling. In this workshop we will view other artists and their approaches to the art world. You will also have the opportunity to create images through four fun and fulfilling projects. So come and show us your story!

Architecture & Math - Design your own dream house! Explore architectural design and mathematics by working on a series of sketch problems and building a cardboard, three-dimensional, scale model of your own design. You'll experience first-hand how math is used in almost everything an architect does --- from thinking about human proportions and designing floor plans to planning room dimensions. Aspects of the natural surroundings will also be discussed and incorporated into the design process. Problem solving will involve both individual and small group work.

Workshop Set #2: July 14-25:

Robotics: Engineering Design Using LegoLogo - What do modern factories and hospitals have in common? They both often use computerized hands to perform delicate precision operations. Take this workshop to be part of an engineering design team - no prior experience necessary! Using standard Lego building blocks, gears, and motors, you will design and build a car. You will also write a computer program to control the car and enable it to respond to sensory data, such as light, solid objects, and sounds. Your team will perform tests on the car, collect data, and compare your results to those of other teams. In the second week of the workshop, you will design, build, and test a machine to do some job that you choose.

Unit Origami: Folding in Geometry - Whether you are a folding fanatic or a folding klutz, you can find a place for yourself in this workshop. By folding beautiful paper squares into three-dimensional shapes, such as boxes, geometric objects (e.g., tetrahedrons, cubes, octahedrons), and sculptures, you will

- improve your ability to visualize mathematical objects
- explore geometric properties of objects
- experiment with shape and color
- make something beautiful to take home
- improve your self-confidence

You may use our origami paper or bring your own magazines, wrapping paper or other paper products to cut and use for your projects.

FOURTH: Make the Workshop choices and mark them on the Course Selection Form
Note that workshop assignments will be made as forms are returned to us, so mailing your form early will help you get your preferred workshops.

FIFTH: Send us your completed selection form by one of the following methods:

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E-mail: **summermath@mtholyoke.edu**
Mail: **SummerMath, Mount Holyoke College**
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