CSI 3.0: Crashes, Lies, and the Look in Your Eyes
Instructor: Christopher Beckwith

Students don their detective badges as they learn the physics of reconstructing a crash, explore how facial recognition programs work, and construct an electronic lie detector. The young investigators will also analyze different samples of evidence such as powders, hair, and ink to determine the guilty suspect.

Welcome to Mars, Your New Home
Instructor: Christopher Beckwith

Participants will use Google Earth and other online resources to explore some of the topographical features of Mars, and by researching the existing conditions, they will determine the factors that must be considered to establish a sustainable human colony on the Red Planet. Following their research, the young colonists will then become specialists, each designing an essential component of a Martian colony. Communication and cooperation will be essential in developing the layout of their colony as they build collaboratively on a specially designed Minecraft server with the Galacticraft/Mars plugin. The colonists will work side-by-side, physically and virtually, racing against time to construct the necessary elements for survival and comfort on a hostile world. Finally, the team will market their colony to prospective settlers with a public relations video.

Bonsai Away
Instructor: Bob Hancock

In this course we will be studying the art, philosophy, and horticulture of Japanese rock gardens and Bonsai trees. For generations, cultured and intelligent peoples from all countries and backgrounds have marveled at this interaction of the living and the spirit. Students will get to make creations of their own to keep as ‘plant pets’.
Should I Eat This?

*Instructor: Bob Hancock*

Why can't I have my burger medium rare? How do we best store milk products? In Food Microbiology, we will discuss the importance of behind safe food habits. Everyone should be aware of the many ways that food can be dangerous. Many of these situations will be explored before, during, and after the process of cooking. Areas of exploration will include bacterial growth and the reactions of different types of bacteria given different types of food. Another topic that will be discussed is how to best store the different types of commonly found in different parts of the world. Foods available during the Revolutionary and Civil Wars will also be discussed, because, what is hard tuck, anyway? We will cook; we will eat; we will work in the lab to see what the dangers are and how to avoid them.

Calculus in a Week: Holy Smokes!

*Instructor: James Robertson*

In this course, we will study a few cool functions (like $x^2$ and sine waves) and learn about some of their cool properties. These will include how fast they go, what they do at infinity (even the infamous "Infinity plus one!") what is going on above and below them, and ultimately arriving at "I know more math than my math teacher!". Through this course you will be introduced to limits, derivatives, differentiation, integrals, and so much more! By the end of the week, we will tackle the question: How do we find the area between two curves?

How to Win Games: The Path to Victory

*Instructor: James Robertson*

In this course, we will study game theory and learn about Nash Equilibriums and other equilibrium states. We will play a lot of games in order to collect data, record and analyze results in Excel, and test new theories. When you go home you can use the techniques you’ve learned to crush the competition in your favorite games!
**Insects, and the Birds Who Eat Them**  
*Instructor: Katie Perez*

Learn how to identify insects and birds out in the field! In this course, we will learn some anatomy which will allow us to identify these creatures in the great outdoors, as well as samples within the classroom. Maine, in the summer, has a plethora of insects to be found in a variety of habitats. Be ready to get outside and find some fascinating animals!

**Ohh Behave! Investigating Animal Behavior**  
*Instructor: Katie Perez*

Why do animals behave the way they do? In this course we will observe animal behavior in videos and through firsthand observation of specimens. We will observe a direct correspondence of behavior to anatomy and habitat. We will also learn about Darwin’s theories and how animal behavior can be an evolutional adaptation. Students will learn about different anatomy features that correlate to certain behaviors. Students will theorize the reason for the various social behaviors of animals, such as aggression, migration, and mate selection. Students will complete an experiment on behavior using earthworms.

**Astronomical Adventure Tours**  
*Instructor: Larry Berz*

Campers, come and thrust yourself into the Universe of Deep Space Interstellar wonder including: White Dwarf Stars, Supernovae, Pulsars, Black Holes, Dark Stuff-Matter and Energy, and Quasars. "Goliath" and our telescope fleet await your gaze as this Tour enters its 19th popular season led by American Astronomy Educator, Lawrence Berz.

**Lift-Off!**  
*Instructor: Larry Berz*

High flying campers will never forget the step-by step assembly and study of rocket design and related preparation for personal deployment into the "New Frontier" A review of American and Russian technological achievement in space will provide perspective and power in driving a quest to the stars.
LEGO Robotics
Instructor: Alex Hennings
You will learn about robotic motors and sensors and how to use them to create many types of robots. Using the Mindstorms programming language, your robot will autonomously drive through mazes, pick up and retrieve items, play golf, and race other robots. Work within your small team to design, build, and test a robot. The exact challenge is up to the students to pick but the instructor will ensure that it is, in fact, a challenge. There will be a focus on problem solving, teamwork, and innovation. #CollaborativeEngineering

It’s A Jungle Out There: Earth’s Amazing Plants
Instructor: Justin Lewin
Where does our food come from? Directly or indirectly, it all comes from plants! In this course, students will be exposed to the world of plants – with activities and lessons that dabble in all aspects of botany. Students will learn about plant evolution, anatomy, and physiology through hands on activities both in the classroom and outside. Moving backwards through time, from the largest and most complex seed producing plants to the smallest of the algae, students will explore the broad group of organisms that are essential to life on earth. Being in Aroostook County with access to both forests and agricultural fields, students will explore the plants that we depend on daily.

Civil Engineering: The Great Bridge Challenge
Instructor: Justin Lewin
Most people use engineered structures every day without giving them much thought. Bridges, dams, and multistory buildings are among the greatest accomplishments of civil engineers. In this course students will learn about engineered structures and will have hands on experiences with the typical materials used in bridge construction. Students will be challenged to design and construct bridges using a limited amount of material. Bridges will be evaluated on the weight capacity and distance spanned. This course will help students appreciate the infrastructure they use on a regular basis and may inspire the next generation of civil engineers.
Mathemagical Origami: The Math & Magic of Origami
Instructors: Diana Flores & Nicole Karod

In this fun, hands-on class, students will explore the mathematical principles behind different paper crafts such as basic origami, modular origami, action models, kirigami, and hexaflexagons. Students will create a variety of models from basic origami frogs to carambola flowers, enneagonal module boxes, and magical hexaflexagons. With two instructors leading this class, all levels from beginning folders to origami masters will be able to work at their own pace and learn new models and techniques.

Math Cubed: Rubik’s Cube
Instructor: Diana Flores

Do you want to learn to solve the Rubik’s Cube? This course is for students new to solving the Rubik’s Cube. In this fun, hands-on class, students will learn an algorithm for solving the 3x3 Rubik’s Cube, study the geometric properties of the Cube, and create a mosaic with multiple Rubik’s Cubes.

ADVANCED Math Cubed: Beyond the Rubik’s Cube
Instructor: Diana Flores

So, you can solve a Rubik’s Cube? This course is for students who know how to solve a 3x3 Rubik’s Cube. If you have already taken the Rubik’s Cube course at MSSM camp, this is the class for you! Students will review how to solve the Rubik’s Cube and then further explore the mathematical principles associated with the Rubik’s Cube, increase their solving speed, and plan and create their own mosaics.

Computer Programming
Instructor: Alex Hennings

This will be an introduction to computer programming. Students will learn a computer language called Processing and create a game of their own. The class project is chosen by the students and we all work through it together. By the end, you’ll have a basic understanding of programming and a way to continue working on it beyond summer camp.

Pieces and Parts
Instructor: Alex Hennings

Have you ever wondered what is inside a computer? Or tried to understand a patent? Students will disassemble, reverse engineer, and research electronic junk. Once the dust has settled, you’ll have the opportunity to present your findings (and rubble) to the class. Gadgets slated for destruction may include cell phones, VCRs, and whole computers.
Don't Let it Smash to Smitherines
*Instructor: Naomi Marthai*

This course will involve designing and constructing two protective devices. 1. Lightbulb Drop Objective: create a protective device for a lightbulb, using limited materials (a manila folder, a paperclip, 2 feet of string, 6 inches of tape, rubber band) for an 8 foot drop onto a brick without suffering any internal or external damage. 2. Egg Crusher Objective: Using as little newspaper as possible, construct a protective device for a raw egg that can sustain 10, 20 and then 30 pounds without any eggstrophes.

What Happens When I...
*Instructor: Naomi Marthai*

In the course "What happens when I...," students will participate in cool chemistry! When chemicals get mixed, the results can be anything from brightly colored products to rapid gas formation. Find out what happens when we ask questions such as 'What happens when we trap that gas in bubbles?' and, "How high can you get your Alka-Seltzer rocket to go?" Explore why these reactions happen and the chemical equations behind them.

Let's make a“Math-terpiece”: Using Math to make Art
*Instructor: Nicole Karod*

Students will use art, to discover different mathematics concepts such as geometry and graphing, using math tools such as protractors, ratio and proportions, as well as Pi. We will look closely at geometry with a focus on angles, the use of a protractor, and symmetry. Each math concept will create an amazing art piece, including string art, optical illusions, tessellations and a watercolor.

Paper Flight and Aerodynamics
*Instructor: Nicole Karod*

Students will learn about aerodynamics, flight, and Bernoulli’s principle. Each day we will discover a different concept of flight while making airplanes out of paper. During the week, we will test different papers, airplane models, and launching techniques in order to discover how aerodynamics apply to paper. Students will then use all their knowledge to create the ultimate paper airplane and compete against one another in distance trials.
*Be sure to submit the electronic version of this 2016 Course Selections Form through your child’s CampMinder account.

2016 MSSM SUMMER CAMP
Girls' Weeks
Course Selections

Camper Name: ____________________________________________________________

First   Last

Camper Week(s):

☐ Girls' Week 1: July 17-July 23
☐ Girls' Week 2: July 24-July 30
☐ Girls' Week 3: July 31-August 6

Directions: Please indicate the order of your top ten choices for courses. Mark a “1” for your first choice and a “10” for your tenth choice. Please do not mark any “ties.”

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Course offerings are based solely on instructor available.