

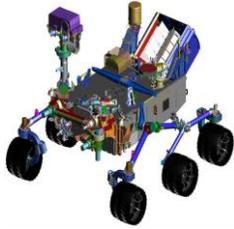
2014 COURSE SELECTIONS: BOYS' WEEKS

MSSM SUMMER CAMP

*Note: These are last year's courses.
The 2015 courses will be released in the spring.*

NASA Engineers

Instructor: Kate Bailey

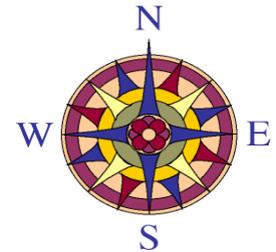


Due to the extreme conditions and distances of deep space, we have not sent humans to explore other planets. As an engineer for NASA, you are constantly presented with problems unique to space travel and research, and must develop innovative solutions to further our investigations. Each day you will be briefed on a new NASA challenge where you will design, build and test your ideas to overcome these problems, just like the professionals! Each day will increase the innovation and complexity of our challenges.

Surviving the Wild

Instructor: Kate Bailey

Do you ever imagine yourself as an explorer on wild adventures? Wish that you could head into the wild and provide for yourself? Dream no more! We will learn the survival skills that are the foundation for any outdoor exploration and the science that accompanies them. We will learn how to build different types of shelters, develop compass and fire building skills, and even munch on edible plants. The last day will involve a competitive adventure challenge that will depend on the skills we developed throughout the week.



Welcome to Mars, Your New Home

Instructor: Christopher Beckwith

Humans are about to establish a sustainable human colony on Mars, but what will it look like? In this course, you will use Google Earth to learn about the topographical features and existing conditions of Mars. After creating realistic 3D models with Google SketchUp, you will become a specialist designing a part of the Red Planet's Martian colony and collaborate with your fellow colonists in a virtual world (Minecraft server with Martian textures)! Finally, create a public relations video to market the colony to perspective Earthling settlers.



Crime Scene Investigation

Instructor: Christopher Beckwith



Ever wanted to be a crime scene detective? From the moment you visit the crime scene with the police tape barrier and “chalk outline,” you will begin collecting evidence in the form of a mysterious white power, suspicious black fibers, ink samples and fingerprints. As a lead detective, you will conduct a series of tests using microscopes, water, heat, and chemicals to identify the components of each sample. Will your detective skills be good enough to solve this mysterious case?

Lift-Off!

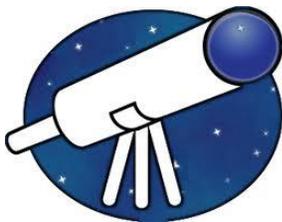
Instructor: Larry Berz

You can do it! Engineer, construct, launch, and recover your own rocket from its flaming flight into the troposphere and back. Campers will investigate rocket theory, propulsion, and calculation, and will review the marvelous milestones of the moon-bound few who left their boot prints on our nearest neighbor in space. Highly recommended for those seeking a life-changing experience!



Astronomical Adventure Tours

Instructor: Larry Berz



Come into cosmic contact with the fundamental wonders and awesome scale of space! You will encounter white dwarfs, supernovas, pulsars, black holes, and quasars. Engineered as a hands-on, exhilarating experience of discovery and activity, this astronomical tour, now in its 17th year at camp, ranks as an unforgettable experience for curious campers.

The Science of Flight: Surfing on Air

Instructor: Daniel Dow

Have you ever dreamed of flying? How does a 450 ton chunk of metal stay in the sky? Whether it's an eagle or a jumbo jet, everything that flies obeys the same simple aerodynamic principles. In this course, campers will learn those basic principles that govern the science of flight by building simple flying machines that actually surf on air. Follow in the footsteps of Leonardo DaVinci, the Wright brothers, and many others in the quest to dominate the sky!



Out of the Box Engineering

Instructor: Daniel Dow

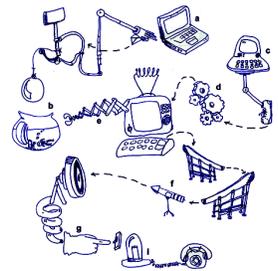


How could you light a candle if all you had was a battery, a plane ticket, hand sanitizer, and a metal dish scrubber? You will discover this and more in “Out of the Box Engineering.” Engineers use their knowledge of the physical world to solve problems, and you can too! Campers will learn various techniques for out of the box problem solving. Then they will use these skills to crack tough and fun engineering challenges.

Rube Goldberg Crazy 3.0

Instructor: John DuFour

Create a gadget of pure imagination! In this course, campers let their creativity run wild. We’ll learn about Rube Goldberg machines, the physics that makes these work (thank you very much Isaac Newton!) and work in teams to build the craziest, coolest, creative machines!



Robotics

Instructor: John DuFour



We’re making robots! Using Lego Mindstorm NXT, we’ll design, build, program and compete our robots. We might race them; we might crash them; we might battle them; we might put them through a maze. Whatever we do, we’ll need to use motors and sensors to get it done.

Zombie Pandemic

Instructor: Wendy DuFour

Zombies are overtaking the world and you are one of the last ones standing. A few remaining scientists struggle to understand the virus and stop the pandemic. In the meantime, how will you protect yourself? In this course, explore the inner workings of the brain and embark on an epidemiology journey as you try to understand the zombie pandemic. We will look at how infectious diseases spread, compare zombie brains with normal brains, and learn the necessary skills for surviving a zombie apocalypse. *(Note: This course includes a guided dissection of a sheep brain.)*



Alien Planet

Instructor: Wendy DuFour



NASA has discovered a new planet, Mundus Novus, on the fringes of our solar system! Exploration rovers searched this new planet, collecting strange soil, rock, unusual liquids, and food samples. Weird alien life forms were also captured and brought back for autopsy. In this course, use biology and chemistry techniques to compare and contrast these alien planet samples with samples from Earth. Does life really exist on this new planet?

Ohh, Behave! Investigating Animal Behavior

Instructor: Perri Fine

Here's your chance to observe animal behavior before your very own eyes! Learn about the many forms of animal behavior that exists amongst different species and in humans. You will create different experiments that focus on the behaviors of worms, termites, fish, bats, pill-bugs... And, for the last experiment, YOU will be the subject!



Dog or Dogfish? Animal Adaptations

Instructor: Perri Fine



Learn how both marine and land organisms have adapted over time to live in very different environments. In this course, we will dissect both land and marine organisms and compare their physiology and anatomy to gain a deeper understanding of how they've adapted to survive in different environments. Each day we will explore an animal adaptation through a hands-on lab experience. *(Note: This course also includes dissections of preserved organisms.)*

Introduction to Computer Programming *(Available Boys' Weeks Only)*

Instructor: Alex Hennings

Computers control so many things around us. But who is controlling the computers? We will be writing programs to make the computer do our bidding. Each student will work on their own version of a large class project which will be chosen as a group. This class is perfect for any camper who loves computers and wants to see some of what's going on behind the scenes. Past projects created in this class have been small games, physics simulators, and fractal generators.



Intermediate Computer Programming *(Available Boys' Weeks Only)*

Instructor: Alex Hennings



This is an accelerated computer programming course intended for campers who have already had some experience programming. We will be using a language called Processing. Campers will be guided through the design and creation of an interactive application using tricky geometry and simple graphics. What will you make? That's up to you!

Codes, Ciphers, and Cryptography

Instructor: Brain Mason

Ever wanted to send secret messages or break the codes of friends and enemies? In this course, you can learn how! Explore the history behind some famous codes and code breakers and find out how knowledge can change the course of history. Use clever math to both create strong ciphers and break simpler codes quickly. You will also learn how modern day encryption and security works to best protect your accounts from devious ne'er-do-wells. *Campers who sign up for this course should be able to add, subtract, multiply and divide whole numbers, fractions and decimals.*



Physics of Ballistics

Instructor: Brian Mason



This course will explore the effects of gravity on different aspects of motion. Campers will conduct experiments to create a method of predicting the motion of launched projectiles. Using a pressurized linear tuber acceleration device (potato cannon), campers will discover the laws of motion and how they can use mathematics to predict where our spuds will land.

Countdown Through the Ages *(Available Boys' Weeks Only)*

Instructor: Marsha Snyder

How long is a cubit? Why do they call it Superbowl XLVIII and not Superbowl 48? Learn about number systems from various cultures in addition to beginning number theory. Move on to the first math problems and solution methods. Make your own abacus and learn how to use it!



Math Magic *(Available Boys' Weeks Only)*

Instructor: Marsha Snyder



You'll be surprised to learn how many "magic" tricks are not magic at all. We'll examine a variety of mind reading, card, dice, coin, and other tricks during the week. Learn the elegant mathematics behind the scenes, become a math magician, and leave camp ready to amaze your friends and family!

INSTRUCTOR BIOGRAPHIES

Kate Bailey

Kate Bailey is currently a STEM and Humanities teacher at Leonard Middle School in Old Town, Maine. She has a master's degree in teaching as well as a bachelor's degree in wildlife ecology. Kate has served as an environmental educator for Bryant Pond's 4-H Camp. She's also served as an adult education teacher, teaching ecology.

Christopher Beckwith

Chris Beckwith has over twenty years of experience teaching physical and life science, math and technology. He is currently a math and technology teacher at Reeds Brook Middle School in Hampden, ME. Beyond the classroom, his after-school computer clubs attract students who share his love of computer gaming. His partnership with the University of Maine is working to introduce Minecraft servers to schools, but he is most proud of his internationally-recognized Star Wars toy collection.

Larry Berz (aka "Sunny Acres")

Larry Berz continues his 17th year of service as an instructor at the MSSM Summer Camps. Larry is also an instructor of astronomy at the Maine School of Science and Mathematics during the school year. He is the planetarium director and astronomy educator at the Francis Malcolm Science Center in Easton, ME. Larry is a native of Chicago, a graduate of Stanford University, and a current resident of Aroostook County, ME.

Daniel Dow

Daniel Dow is an alumnus of the Maine School of Science and Mathematics, class of 2003. He has a bachelor's degree in civil engineering, specializing in structural engineering and construction management. He will also hold a master's degree in teaching as of April 2014. Daniel currently teaches middle school in Indiana. He was a part of the MSSM Summer Camps in 2006, and he also taught camp courses in 2012 and 2013.

John DuFour

John DuFour teaches math and physics at Columbus High School, in Columbus, Mississippi. Before becoming a teacher, he was an engineer for six years. Two of those years, he worked as a test engineer on the Space Shuttle Main Engine program. He tested the Shuttle's rocket engines. John has assisted both Gulport High School and Noxubee County High school in robot competitions. He has a degree in computer science and is working on a master's degree in mathematics. He also serves as an assistant den leader for the Cub Scouts of America.

Wendy DuFour

Wendy DuFour teaches biology at Aberdeen High School in Aberdeen, Mississippi. She also serves as an academic tutor for college students at Mississippi State University. Wendy has a degree in secondary education with a focus in biology. She also serves as an assistant den leader for the Cub Scouts of America.

Perri Fine

Perri Fine has a bachelor's degree in Marine Biology from the University of New England. She is currently in the University of Southern Maine's master's program earning teaching certifications in life and physical science. Perri has served in numerous research and leadership roles including studying the coral reef and mangrove ecosystem in Belize, Central America, serving as an animal care technician and resident advisor at Mouth Desert Island Biological Lab, and studying dogfish gestation at the University of New England's Marine Science Center.

Alex Hennings

Alex Hennings attributes his love and career in computer programming to his own experience as a camper during the boys' camp many years ago. Inspired by a computer programming course at MSSM Summer Camp, Alex went on to major in computer science at the University of Southern Maine. He now uses his vacation time to give back to campers each summer.

Brian Mason

Brian Mason is returning to the MSSM Summer Camp. He taught courses in 2008. He currently teaches science at Lewiston High School. He has a bachelor's degree in Physics from Carnegie Mellon University and completed a teaching certification program through the University of New England.

Marsha Snyder

Marsha Snyder currently serves as a math teacher and department co-chair at Thornton Academy in Saco, Maine. She has a bachelor's degree in economics from Bowdoin College as well as a master's degree in teaching mathematics from the University of New Hampshire. She was nominated for the 2014 Maine Teacher of the Year Award in 2013. She has also been recognized for the Presidential Award for Excellence in Mathematics and Science Teaching as a state finalist in 2002 and 2003.