2025 ASMS STEM LEADERSHIP ACADEMY

COURSE CATALOG

DAY – COURSES (PERIODS A, B, and C – 8:00 am – 3:00 pm)

2D DESIGN

Campers will create 2D designs for CNC (Computer Numeric Control) Laser and Plasma cutters. The class will begin with a brief introduction to 2D Design principles, followed by lessons in Vector Graphics, CAD, and GCODE software. A variety of free and commercial software will be introduced: Adobe Illustrator & Photoshop, Inskape, Lightburn, LaserGRBL, and Firecontrol. With the designs made in this class, campers will learn to cut wood and plastics with a CNC Laser Cutter and cut metals with a CNC Plasma Cutter. If time permits, campers will visit the Laser Studio at the University of South Alabama Creative Technologies Department.
Instructor: Orren Kickliter
Offered: Week 1 and Week 2
Period: C
Room:

3D PRINTING AND DESIGN

In this course, campers will model the workflow of industrial design and progress from 3D Computer-Aided Design software to a 3D physical model. Models will be created using a 3D printer. Campers will get to keep their models.
Instructor: Dr. Matthew Davenport
Offered: Week 1 and Week 2
Period: A
Room:

ACT PREP

Campers who will be seeking admission to colleges and universities upon high school graduation take the ACT test. The higher the score, the greater the college admissions and scholarship opportunities. Early preparation is the key to success! In this course, you will prepare with a professional tutor and practice the sessions along with learning strategies that will increase your confidence along with your scores.
Instructor: Kevin Dolbeare
Offered: Week 1 and Week 2
Period: A
Room:

AI FOUNDATIONS

Dive into the world of Artificial Intelligence (AI) and explore the basic concepts that are shaping the future of technology! Whether you're a beginner or have some prior knowledge of technology, this class is designed to help you understand the fundamentals of AI in a fun, interactive, and approachable way.

Campers will learn how AI works, what it can do, and how it's impacting various industries like healthcare, gaming, robotics, and even art! Through engaging activities, real-world examples, and practical exercises, campers will develop a solid understanding of the building blocks that make AI possible.
Instructor:
Offered: Week 1 and Week 2
Period: C
Room:

ALL ABOUT ANIMALS (**Two-Period Course**)

Do you love learning about animals? Do you have an interest in working in the field of zoology one day? Perhaps you want to be a veterinarian or even a wildlife biologist. If so, this course is for you. Campers will explore the different classes of organisms within the animal kingdom, have hands-on experience dissecting organisms, including invertebrate and vertebrate species, handle preserved specimens, and explore how these organisms compare to one another anatomically. Learn about animal behavior, animal adaptations, and their interactions in the environment. Campers will visit an animal rehabilitation center, visit the animal shelter, and take a trip to a local animal clinic to have a behind-the-scenes tour and speak to the veterinarians.
Instructor:
Offered: Week 1 and Week 2
Period: A & B
Room:

BASIC CHEMISTRY OF THE FOOD WE EAT

Ever wondered why you can't un-boil an egg? Or how do those holes get into your bread? Or what that gross blue stuff is that your parents put on salad? Campers in this class will get to discover the secret world of food by learning how different foods taste, smell, and feed their brain. Topics in Biology and Chemistry will be included in a fun, interactive environment.
Instructor: Dr. Matthew Davenport
Offered: Week 1 & Week 2
Period: C
Room:

BLOCK-BASED PROGRAMMING with SCRATCH

With Scratch, campers can program their own interactive stories, games, and animations. Scratch helps young people learn to think creatively, reason systematically, and work collaboratively. Scratch is a project of the MIT Media Lab.
Instructor: Mr. Gaillard
Offered: Week 1 and Week 2
Period: A
Room:

CODE A MICRO:BIT

Learn how to program a micro:bit, a really cool mini-board computer that has LED lights, a radio

and Bluetooth antenna, a compass, a temperature sensor, and an accelerometer plus pins for attaching external sensors. Use your imagination to create games and experiments or make a banana beatbox. We'll start with simple projects to display text and icons. Learn to write programs to keep score, play a song, or send secret messages to a friend's micro:bit. You'll be amazed at what you can do and control by the end of the week!
Instructor:
Offered: Week 1 and Week 2
Period: B
Room:

CREATIVE CHEMISTRY: LABS OF DOOM
Lab work is important to scientific inquiry and in this class, campers will explore science from a different perspective. This course will mimic the laboratory experiments of famous fictional scientists while introducing students to basic laboratory principles and processes. Campers should be prepared to be wowed and amazed. C a m p e r s will do a hands-on laboratory activity each day and as a result, closed-toe shoes will be required daily (no flip-flops allowed).
Instructor**:** Kevin Dolbeare
Offered**:** Week 1 and Week 2
Period**:** C
Room**:**

CYBERDEFENDERS
Delve into the world of Cybersecurity by experiencing a week of learning about the basics of cybersecurity and web infrastructure and how to defend against the bad guys! It's the perfect way to get introduced to the expanding and important field of cybersecurity! In this course, campers do not need to have any prior knowledge of cybersecurity to participate and by the end of the week become CYBERDEFENDERS!
Instructor:
Offered: Week 1 and Week 2
Period: A
Room:

DEBATE
When we feel strongly about something, it can be difficult to calmly argue with someone on the topic. However, staying calm and rational can be the best skill in these instances. Making sure to structure your argument logically is a necessary skill. In this class, campers will discuss what debate is, common forms of debate (Lincoln-Douglas and Public Forum), and how to effectively debate with others. Debating is a great way to improve your thinking and hold conversations that actually help change people's minds.
Instructor:
Offered: Week 1 and Week 2
Period: C
Room:

DISCOVERING THE WORLD OF TECHNOLOGY

From industrial cranes to cutting-edge ships and planes, explore the manifold applications of engineering science, and the exciting ways new technologies are transforming our world. This course will take campers to local facilities where engineering science is being applied such as Airbus, Austal, AM/NS Calvert Steel Mill, and others to see and learn firsthand about these exciting applications and innovations!

Instructor: Fabeah Boateng

Offered: Week 1 and Week 2

Period: C

Room:

ELECTRICAL ENGINEERING

From computers to microprocessors all the way to giant power generation for cities -- electricity runs the world! So much of what we do requires and revolves around electricity, and electrical engineers are the people who help work to create and sustain that power! Come learn the foundational principles of electrical engineering through engaging, hands-on activities that will put a "spark" in your summer camp experience!

Instructor:

Offered: Week 1 and Week 2

Period: B

Room:

GEOLOGY ---DIGGING DEEPER THROUGH MINECRAFT

Geology is the science that allows us to unlock the secrets of the earth by studying rocks and stones, geochemistry, and geobiology. By "digging deep" into the earth, mysteries of the past and even the future can be uncovered. Many campers have been introduced to the science of Geology through the program Minecraft and in this course, campers will compare and contrast both the real and virtual worlds both in class and with three field trips to answer a multitude of questions such as "Can you really make a suit of diamond armor?" "Can obsidian stop TNT?". Other real-world geologic processes replicated in the program will also be examined and "dug into"!

Instructor: Kevin Dolbeare

Offered: Week 1 and Week 2

Period: B

Room:

HANDS-ON GEOMETRY!

Get your "hands-on" in this Geometry course by creating tetrahedron kites, Pythagorean spirals, and robots from 3D figures. Haven't taken Geometry yet? Don't worry! You will learn the geometry concepts needed to complete your projects.

Instructor: Kristal Webb

Offered: Week 1 and Week 2

Period: B

Room:

HOW THINGS MOVE AROUND THE WORLD

Campers will explore the fascinating world of global logistics—discovering how goods travel across the globe via shipping, rail, and air. Through hands-on activities, interactive lessons, and exciting field trips they will learn how everything from toys to technology, food to fashion, gets from one place to another. As a global logistics hub, Mobile AL is an exciting place to learn about this up close!

Instructor:

Offered: Week 1 and Week 2

Period: A or B

Room:

INDUSTRIAL DESIGN

Industrial Design is where science, technology, and design come together to create the products of the future. In this introductory class, campers will design and create their own functioning portable Bluetooth speaker. To complete this, campers will need to learn to read an electronic circuit schematic, use a multimeter to test resistance, capacitance, voltage, induction, and current, understand introductory Thiele/Small Acoustic Parameters, drill, solder, saw materials, 3D print, and practice the fundamentals of 3D Design. Closed-toe shoes will be required.

Instructor: Orren Kickliter

Offered: Week 1 and Week 2

Period: A

Room: West Campus

INTRO TO ALGEBRA

Campers will be introduced to concepts such as solving equations and inequalities, order of operations, properties of exponents, and linear functions, through the use of interactive activities and fun math games. Great preparation for campers who will be taking Algebra I and also for those wanting advanced preparation for the ACT and standardized testing.

Instructor:

Offered: Week 1 and Week 2

Period: A

Room:

INTRO TO ENGINEERING

This hands-on, interactive course introduces campers to the exciting world of engineering. It provides an overview of various engineering fields such as marine, aerospace, civil, mechanical, and computer engineering. Through fun projects, challenges, collaborative problem-solving, field trips, and guest speakers, students will gain a deeper understanding of how engineers approach real-world problems.

Instructor:

Offered: Week 1 and Week 2

Period: C

Room:

JOURNALISM

News reporting is an extremely important part of society. In our technologically savvy society, the way we read the news is always changing. For example, a large part of the population gets their news from social media. Despite all of this, the basics of journalism have not changed. In this class, campers will look at the changing world of news and discuss how to report and research it. In addition, campers will work to improve writing skills and learn how information is presented.

Instructor:
Offered: Week 1 and Week 2
Period: A
Room:

LAND, SEA, AND AIR: BUILDING CARS, BOATS, AND PLANES...

Learn the latest automobile designs, how boats float, and how planes fly. Not only will campers learn the science behind various modes of travel, but will design, build, and test working models: boats that float (or not!), planes that fly, hot air balloons that float, and rocket cars propelled by air. Campers will also "dive in" and come to understand the mechanics behind one of the greatest design disasters of all time --- the Titanic.

Instructor: Glen M. Mutchnick
Offered: Week 1 and Week 2
Period: C
Room:

MARINE BIOLOGY

Earth is mostly water that is teeming with all types of incredible and interesting life! Marine Biology introduces campers to the living things that inhabit the earth's waters from the beautiful deltas to the deep ocean and covers broad areas of biological oceanography, physical oceanography, and technology. Campers will also learn why the oceans are important to humans and how human activities affect the marine environment.

Instructor:
Offered: Week 1 and Week 2
Per: AorB
Room:

MATH GAMES

Get ready for exciting and interactive math fun! The *Math Games* class is designed to make math concepts come alive through engaging games, challenges, and hands-on activities. Whether a math enthusiast or someone looking to make numbers a bit more enjoyable, this class will show campers that math isn't just about equations—it's about creativity, strategy, and problem-solving.

Instructors:
Offered: Week 1 and Week 2
Period: B or C

Room:

MINI MEDICAL SCHOOL (3 Period Course)
Get ready future doctors! Mini Med School is an awesome opportunity to delve into the exciting world of medicine! From learning how to suture (stitch or close a wound), DNA Analysis, How X-Rays Work, the Patient Interview Process, Clinical Manifestations of Disease, and more, to field trips to the USA College of Medicine and to meet local medical experts, this will be a phenomenally immersive experience! **(Extra $100 fee for this course)**
Instructors: USA College of Medicine Students:
Offered: Week 1 and Week 2
Period: A, B, and C
Room:

MECHANICAL ENGINEERING
Are you interested in how things actually work, and how they are built? Do you enjoy taking things apart and putting them back together? You just might be an aspiring mechanical engineer, and this is the perfect summer camp course for you! Discover how mechanical engineers put the 'engine' in 'engineer', the creative process of "design thinking" and so much more!
Instructor:
Offered: Week 1 and Week 2
Period: A
Room:

ORIGAMI: ARTFUL MATHEMATICS
Origami is an engaging and beautiful, yet calming art form through which one can learn the principles of mathematics by creasing paper rather than writing out calculations. Campers will create modular origami polyhedra, deconstruct origami animals to reveal the crease patterns and the underlying mathematical principles governing them and learn how to tile the plane by creating origami tessellations. No prior folding experience is necessary, but experienced folders are welcome and all campers will be given projects that challenge them at their own level.
Instructor: Kristal Webb
Offered: Week 1 & Week 2,
Periods: A or C
Room:

PHUNDEMNTALS OF PHYSICS
In this course, campers will examine various concepts in Physics using a hands-on application approach and participate in awesome laboratory experiences; some "shocking," some very sharp, and some that deal with 1000-degree soldering tools. Examples of some of the cool laboratory experiences that campers will share include discovering the answer to; will a bullet dropped to the floor hit the ground at the same time as a bullet fired horizontally from a gun? Campers will also discover the answers using projectile motion models and laboratory experimentation. Campers will experience 50,000 volts of static electricity using a Van de Graaff generator. The big project of the week will be building a circuit board using resistors, capacitors, and transistors, and at the same time, the campers will learn how to solder all the

components to the board.
Instructor: Glen M. Mutchnick
Offered: Week 1 and Week 2
Period: B
Room:

PUBLIC SPEAKING
In high school, college, and almost every career, speaking in front of others is a required skill. More than 75% of people say they are scared to give speeches. However, it does not have to be as scary as we like to imagine. In this class, campers will learn how to write a speech, practice it, and present it. This class is great for everyone, especially those who feel intimidated by public speaking or know it will play a major role in their future.
Instructor:
Offered: Week 1 and Week 2
Period: B
Room:

PYTHON BASICS
This course reviews the basic syntax of the Python programming language. Campers will learn about printing, data types, variables, user input, operators, random, conditionals, and loops. Campers will also be expected to work on assignments to reinforce training topics.
Instructor: Mr. Gaillard
Offered: Week 1 and Week 2
Period: B
Room:

ROBOTICS
This class will explore the applications of robotics in the real world. From spacecraft to unmanned submersible vehicles, robots can do anything that we create them to do. Campers will learn about the basics of building and programming a robot. They will be divided into teams to build and program a Lego Technic Robot to perform a simple set of tasks, such as delivering supplies over a taped-off course, stopping on a colored dot, and picking up small objects. As the class progresses, campers will move on to the harder tasks that combine elements of the previous challenges. An example would be a scenario in which the campers must pick up and deliver supplies to an outpost over difficult terrain. This will allow campers to face real-world problems of Robotics Engineering from start to finish while having fun at the same time.
Instructor:
Offered: Week 1 and Week 2
Period: A, B, or C
Room:

ROCKETRY
Campers will build various designs of model rockets in class!! During this course, campers will learn about NASA and rocket design, leading up to their official launch date at the end of the

week. Before building and launching model rockets, campers will perform real-time engine thrust tests and data collection of various engine types. Each camper will electronically launch his/her own rocket to altitudes of up to 1,000 feet!!
Instructor:
Offered: Week 1 and Week 2
Period: A, B, or C
Room:

STUDYING NATURE-FIELD BIOLOGY (Two-Period Class)
Learn about the forests, savannas, streams, and shores of the Alabama Gulf Coast. Campers will participate in a series of field trips to various nearby habitats, with an emphasis on nature study and biological investigation. Activities will consist of hiking the maritime forest on Dauphin Island, kayaking the delta of the Gulf of Mexico, bird watching in the bird sanctuary on Dauphin Island, collecting organisms in the salt marshes of Dauphin Island, nature study, visiting an ancient Indian Mound, and using a map and compass. Campers will journal their experiences using digital cameras (phones).
Instructor:
Offered: Week 1 and Week 2
Period: A and B
Room:

TECHNOLOGY AND DESIGN OF LIGHT METALS
This class will introduce the basic theory, tools, and skills of metalworking. While introducing various properties of nonferrous metals, campers will saw, pierce, shape, solder, anneal, torch, melt, oxidize and cast different metals. Closed-toe shoes will be required.
Instructor: Orren Kickliter
Offered: Week 1 and Week 2
Period: B
Room: West Campus

TECHNOLOGY ENTREPRENEURSHIP – INVENTING THE FUTURE!
Whether you want to be the next Mark Zuckerberg or simply looking for a way to build something that could make money and help people, this class will help give you the right foundation and skill set. Through this course, campers will learn how to identify and build something that customers want, learn how to test their hypotheses, and hear from actual entrepreneurs building technology companies today!
Instructor: Nick Hampton
Offered: Week 1 and Week 2
Period: A or B
Room:

UNDERWATER ROBOT MISSION
Build an underwater robot – a remotely operated vehicle (ROV) -- to complete an underwater Spanish galleon mission. Campers form small ROV companies to build an ROV, mission props,

and tools for their mission tasks. They learn to pilot the ROV in the pool to collect sea urchins for scientific research, transplant endangered corals, and recover a cannon and shipwrecked items to identify the Spanish galleon. Other learning topics include buoyancy and ballast concepts and electrical circuits. In addition, campers learn about real-world ROVs designed for different missions from collecting organisms from under the polar ice cap to exploring the ocean on Jupiter's moon Europa.
Instructor:
Offered: Week 1 and Week 2
Period: B or C
Room:

WEBPAGE BASICS
This course will teach campers how to use Bootstrap with VS Code. They will learn how to set up a webpage using the most popular syntax.
Instructor: Mr. Gaillard
Offered: Week 1 and Week 2
Period: C
Room: