2017 TJHSST Middle School Technology Institute Course Descriptions

Fun with Electronics

In typical consumer electronics, microcontrollers are used to control many different functions. This course is designed to give students a deeper look and explores how to program and control a Arduino microcontroller. Students will receive lessons about simple electronic circuitry, and will be introduced to computer programming using the C++ computer language. We will look at LED circuits, digital sensors, and various analog sensors. Ultimately students will produce a working robot using a microcontroller to navigate through a set maze.

Length of course:	**One week**
Dates Offered:	**July 10-14** **July 17-21** **July 24-28**
Registration Fee:	**$200.00**

Web Page Design

Students will create a company website! They will start by creating a logo in Photoshop CS5 and then create the site using HTML coding and Dreamweaver CS5. Students will study the thought process behind the design, marketing and creation of the business site. They will then create a short infomercial for their company in PowerPoint or Flash CS5 to incorporate into their website.

Length of course:	**One week**
Dates Offered:	**July 10-14** **July 17-21** **July 24-28**
Registration Fee:	**$200.00**

Got an App for That?

This one- week course will introduce the field of Computer Science by teaching students how to build apps for Andriod smartphones using AppInvebtor software. Students will design apps and learn basic programming constructs along the way, something that will be useful for students who will take computer programming courses in the future. Students will learn the basics of interface design and usability testing. Students will discover how smartphone apps have drastically improved the lives of people and will apply what they have developed in a culminating project at the end of the week. Students are encouraged to bring their own Laptops if they choose.

Length of course:	**One week**
Dates Offered:	**July 10-14** **July 17-21** **July 24-28** **July 31-Aug 4**
Registration Fee:	**$200.00**

Design for Disaster

This course explores the design, construction, and testing of a variety of structural models and the methods and logic behind designing for specific natural and man-made disasters. Based on core structural design concepts, students will work in small groups building models to perform specific structural functions including towers, bridges, dams and containers that are then put through a series of tests of their structural integrity

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Ethnomathematics – The Mathematics Behind Culture and Civilization

Like any science, math changes and develops over time. Cultures change and adapt math - it evolves. Move with mathematics through history:

- Learn caveman math – yes, it is a real thing
- Do quadratic equations on clay tablets in Babylonian
- Build replicas of the Pyramid at Giza using Egyptian Math and the measuring tools of the time period
- Walk in the footsteps of the greatest minds of the Greek Philosophers as they uncover the secrets to the third dimension
- Learn why the Romans never discovered much in Mathematics and contributed little
- Schedule the Emperor's appointments in Ancient China using calendars and Mathematics
- Learn the secret that Indian religions unlocked for Astronomy that changed our understanding of numbers forever
- Understand why at one time Baghdad was the world's center for learning advanced science, mathematics, chemistry, and medicine

Length of course:	**One week**
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Registration Fee:	**$200.00**

Introduction to 3D Printing

Students taking this course will be introduced to Computer-Aided Design (CAD) software and 3D printing. Students will design, 3D model, and 3D print solutions to given problems. Topics include engineering design process, part design using Autodesk Inventor, Assemblies in Autodesk Inventor, and 3D printing technology.

Length of course:	**One week**
Dates Offered:	**July 17-21** **July 31- Aug 4**
Registration Fee:	**$200.00**

Infectious Biological Outbreak

Viruses are one billionth the size of a human being, but have caused havoc and altered human history. Students in this course will have the opportunity to work as epidemiologists and be introduced to many real historic epidemics. They will trace outbreak victims back to their sources, and develop techniques to control the outbreak. Students will learn about modern public health threats such as Ebola virus and what it is like to work as a researcher in a biolevel four containment suit.

Length of course:	**One week**
Dates Offered:	**July 24-28**
Registration Fee:	**$200.00**

Exploring Engineering Design

During this week long course students will be introduced to the exciting world of engineering! They will become engineers by participating in a variety of activities that will challenge their critical thinking and problem solving skills. Along the journey they will be introduced to the engineering design process and physics principals to successfully accomplish each design challenge. Students will have the opportunity to design aerodynamic CO2 dragsters, test the tensile strength of handmade bridges, and experience smaller challenges throughout the week. This hand-on course is designed to excite students to take engineering and technology course in the future!

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