

## TJ Summer Tech Institute Course Descriptions

For registration, please visit the online registration site  
 ([http://www.fcps.edu/DIS/OACE/summer/tj\\_institute.htm](http://www.fcps.edu/DIS/OACE/summer/tj_institute.htm)).

For questions, please visit the Summer Tech Institute website

(<http://information.tjhsst.edu/sumtechins.html>) or our [Frequently Asked Questions](#).

Course Title	Description	Course Number and Offerings
Engine Dissection and Construction	Have you ever wanted to know what the inside of an engine looks like? Do you want to learn how to make an engine that runs on a candle? Students will explore the fundamentals of internal combustion engines and Stirling engines through this one week course. Each student will learn about the internal workings of an internal combustion engine through a complete “hands-on” dissection down to the rings around the cylinders, then rebuild and test for success. Finally students will learn about and construct fully functional Stirling engines that run on a candle and can be taken home at the end of the week!	Five full-day sessions 8:30 am – 2:00 pm  Week 2  <b>TJ0-2552</b>
Global Navigation - GPS	Where is the restaurant located? Students will learn how to operate a GPS receiver, how Global Positioning Systems work and measure accuracy of their positions. Computers will be used in class to interface with GPS equipment. Students will learn how to bring GPS data into CAD or GIS software for data visualization. Instruction will be 50 % outside and it is important to dress for the weather.	Five full-day sessions 8:30 am – 2:00 pm  Week 1 <b>TJ0 – 2301</b>
Science, Technology, and Sound.	Students will engage in activities and small projects to explore the physical properties of sound, acoustics, human hearing, music instruments, as well as the properties of digital technologies used to record, replay, and generate sounds and music. Students should be comfortable with learning new mathematics since some emphasis will be given to learning about mathematical relationships that determine sounds.	Five full-day sessions 8:30 am – 2:00 pm  Week 1 <b>TJ0 – 2701</b>
Creative Writing	During this creative writing class students will learn different styles of writing. They will explore many different forms and styles of writing to find	Five full-day sessions 8:30 am – 2:00 pm

	<p>their own writing style and voice. Students will have in-class writing assignments with prompts and have the opportunity to share their work with the rest of the class. Students will read poetry and short fiction from many different contemporary writers from diverse backgrounds. Although, this class will use short fiction and poetry as a guide on form and structure, the class will focus mainly on students' writing. This is an opportunity to have fun with writing and read some great stories and poetry.</p> <p>--If there's a book you really want to read, but it hasn't been written yet, then you must write it. ~Toni Morrison</p> <p>--What I like in a good author is not what he says, but what he whispers. ~Logan Pearsall Smith, "All Trivia," <i>Afterthoughts</i>, 1931</p>	<p>Week 1 <b>TJO – 2001</b></p>
Forensics, Science and the Law	<p>This week long class will focus on the integration of science and the practice of law, the necessity of forensic evidence versus the pitfalls of eye witness accounts, investigating a typical crime lab, understanding evidence collection and protection, and the analysis of fingerprints, bloodstains, and other impressions. We will also study famous cases that were significant breakthroughs in forensic science. At the end of the week of training there is a <i>possibility</i> that there will be a trip to the local crime lab for a true forensic experience.</p>	<p>Five full-day sessions 8:30 am – 2:00 pm</p> <p>Week 1 <b>TJO - 2201</b></p>
Merging of Art, Science, and Technology	<p>Art and technology will merge in a week long exploratory class designed to integrate traditional art with modern technologies. Students will learn to draw and design in a 2D space, develop story boards, animate, utilize digital photography equipment, and experiment with digital editing software to make connections between visual literacy from the past, present and in the future.</p>	<p>Five full-day sessions 8:30 am – 2:00 pm</p> <p>Week 1 <b>TJO – 2601</b></p> <p>Week 2 <b>TJO – 2912</b></p>
Calculator, Probes, Math.... Go!	<p>Explore the numerous features of the TI-84 (83+) which can be used to enhance math and science activities. Included will be basic functions of the hand held device with extension into data analysis and probeware. Visualization of data through graphing, fitting best fit lines, and gathering experimental data points will link the math and</p>	<p>Five full-day sessions 8:30 am – 2:00 pm</p> <p>Week 2 <b>TJO – 2902</b></p>

	<p>science curriculum. Learn how to use the STAT and Y= menus enhanced by other features of the handheld. Free Applications (APPS) available from the internet will be explored, including Study Cards and Notefolio. Activities will include introduction to the CBL and Vernier probeware in data collection. Part of the activities will use hypothesis testing and setting up simple experiments which could lead to future science projects and science fair entries. (Does not include programming for games.)</p>	
<p>Sit down and take a stand!</p>	<p>Students will be able to improve their speaking and writing skills through a focus on personal opinions and arguments. A focus on issues with more than one side will be introduced; some will be followed by group debate, others by research, and most by a personal writing intended to articulate an argument and defend an opinion. A focus on a personal stance will increase interest in the writing topics; interest increases understanding and progress. Skills developed during this week will easily transfer to later academic topics in the normal school setting and make students more organized and effective writers.</p> <p>Eight to ten topics will be covered during the week. Some potential topics include: The Internet -- Blessing or Curse?; Do video games make young people more violent?; Should homework be banned?; current events; etc.</p>	<p>Five full-day sessions 8:30 am – 2:00 pm</p> <p>Week 2 <b>TJ0 – 2922</b></p>
<p>Stamp Computers</p>	<p>Ever been curious how that toy box plays a tune? Students will learn how to program a Basic Stamp IC module to make it perform tasks. The class will learn to make circuits on a breadboard and control the light and sound circuits with the Parallax BS2 Basic Stamp micro-chip. We will finish with using servos to run simple robots.</p>	<p>Five full-day sessions 8:30 am – 2:00 pm</p> <p>Week 2 <b>TJ0 – 2932</b></p> <p>Week 3 <b>TJ0 – 2413</b></p>
<p>Cool Chemistry</p>	<p>This week long course will provide students with advanced Chemistry knowledge and skills through problem solving, laboratory investigations, and scientific readings. Completion of Algebra I prior to enrollment is required for taking this course. This is a challenging, upper-level program designed for highly motivated students who desire to be actively engaged in an Advanced Chemistry Laboratory, to learn about topics that rely upon</p>	<p>Five full-day sessions 8:30 am – 2:00 pm</p> <p>Week 3 <b>TJ0 – 2953</b></p>

	strong mathematical skills and scientific curiosity, and to explore hands-on activities related to Chemistry.	
Meteorology - Weather & The Atmosphere	This course will cover topics pertaining to weather, forecasting and climate. Students will be introduced to properties of the atmosphere, forecasting, climate change, and basic atmospheric chemistry and physics (age appropriate). Students will be introduced to the basics of the atmosphere, and by the end of the class they will be able to produce a forecast of their own. The class will assume no prior understanding of meteorology.	Five full-day sessions 8:30 am – 2:00 pm  Week 3 <b>TJ0 - 2403</b>
Intro to Web Design	This is a beginning web design course for the students who have not had any experience creating web documents from HTML code. Students will learn the latest web standards, how to use HTML to format text, insert images, and create links, lists, tables, and frames.	Five full-day sessions 8:30 am – 2:00 pm  Week 3 <b>TJ0 – 2983</b>  Week 4 <b>TJ0 – 2464</b>
Digital Photography	This course would require students to bring their own digital camera. We would learn the basics of photo composition and digital darkroom. Students would be required to shoot photos and bring them in for critique. If possible, we might also take a "photo field trip." Students would also produce a "What if" plan for a photo shoot about a social issue of their choice.	Five full-day sessions 8:30 am – 2:00 pm  Week 3 <b>TJ0 – 2973</b>  Week 4 <b>TJ0 – 2444</b>
It IS Rocket Science!	Using water bottle and small model rocket kits students will explore the aerodynamics, energy, and momentum issues in rocket design and recovery. Students will learn to find center of mass and center of pressure by graphical and experimental methods as part of learning how rockets are designed. Students will, by the end of the week, build and fly small scale rockets designed to meet a specific performance requirement (flight duration, height, recovery duration, etc...). Students are required to wear goggles during launch and recovery operations in accordance with FCPS and VA regulations.	Five full-day sessions 8:30 am – 2:00 pm  Week 4 <b>TJ0 – 2474</b>
Journalism  <i>Four-day course, \$160.</i>	This course will provide an introduction to the fundamentals of scholastic journalism. It will cover the basics of news writing, reporting technique, layout jargon, and an understanding of	<b>Four</b> full-day sessions 8:30 am - 2:00 pm

	<p>First Amendment rights and ethical conduct. Students can take this knowledge back to their middle and high school journalism programs for use on yearbook and newspaper publications. <i>Note: This class will only be four days long (M-Th).</i></p>	<p>Week 4 (7/28 – 7/31). <b>TJO – 2494</b> \$160 for the four-day course.</p>
--	--	---