



Program Description Course Offerings

Utica Center for Science and Industry-School Profile

The Utica Center for Science and Industry (UCSI) is a selective half-day magnet program for students interested in engineering, mechatronics, or multimedia production. UCSI students spend ½ day, grades 9-12, studying at the center and ½ day at their home high school. Their course of study each year consists of the core content courses of English language arts and mathematics, as well as an elective in the career pathway of engineering technology, mechatronics, or multimedia production. While all UCSI subjects are taught each day, highly flexible time scheduling fosters opportunities for innovative cross-curricular projects, work-based learning opportunities, and instructional opportunities provided by our industry partners.

UCSI elective courses are unique within the district and focus on learning highly technical skills using industry-grade technology to solve real-world problems. Cross-curricular projects (which encompass the students' English course, mathematics course, and elective course) are completed each semester, providing a unique opportunity for application of English and mathematical skills. It is noteworthy that our cross-curricular projects are completed *in addition to*, rather than in place of, the core content that is learned in the four comprehensive Utica high schools; UCSI English and mathematics courses encompass the same common core state standards as their high school counterparts, including student completion of the same anchor texts, writing assignments, and end-of-course assessments.

UCSI Graduates

The UCSI was started in 2008 as part of a federal Voluntary Public Schools of Choice grant and graduated its first class in 2012. Each year our seniors surpass the local and state average on all areas of the ACT/MME tests. Ninety-eight percent of our graduates enrolled in post-secondary study and now attend various colleges and universities including Lawrence Technological University, Kettering University, The University of Michigan, Albion College, Baker College, Michigan State University, Macomb Community College, Central Michigan University, Wayne State University, Ferris State University, the College for Creative studies, and Full Sail University in Orlando, FL.

Awards

In 2011, the UCSI was awarded the prestigious Educational Program of the Year from Automation Alley, Southeast Michigan's preeminent technology business association. Additionally, UCSI was selected as the Michigan Association of School Board's Program of Excellence in the area of creative and media arts. We have been recognized by the Michigan Association of School Administrators and the Michigan Department of Education Office of Career and Technical Education for their Excellence in Practice award.

Application Process

Students apply online (<http://csi.uticak12.org>) during their 8th grade year for admittance as a 9th grader. Applicants are invited to take an entrance test which consists of mathematics, reading, and writing. Qualified students, who are determined through their application information, academic record, and entrance exams, are placed into a lottery after which we invite numbers 1-90 and continue through our waitlist as we receive declines.

Course Offerings

Grade 9

English 9-Composition and Genre study
Geometry (or AP Computer Science)
Design Principles

Grade 10

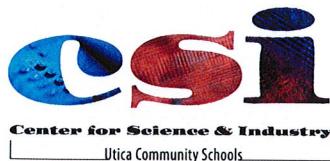
English 10-American Literature/Composition
Accelerated Algebra II or Algebra I
Introduction to Electronics or Digital Media

Grade 11

English 11-British Literature/Composition
Algebra II or Accelerated PreCalculus
Engineering Tech, Mechatronics, or Multimedia
Production I

Grade 12

English 12-World Literature/Composition
AP Calculus, Pre-Calculus, or AP Computer Science
Engineering Tech. II, Mechatronics II, or Multimedia
Production II



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Course Descriptions

English 9-UCSI

The major emphasis in this course is on writing and reading skills through a study of informational text, drama, poetry, the short story, the novel, and the essay. Critical thinking, analytical, and presentation skills are emphasized. Application of skills to other CSI courses and research is part of the required work in this course. Areas of study are based on the Common Core State Standards.

English 10-UCSI

This course stresses the development of critical thinking, reading, writing, and speaking skills. Students develop these skills in correlation with the study of traditional American Literature as well as pieces relevant to their path of study within the UCSI. Anchor texts are those of canonical American writers. Cross-curricular application of skills, demonstration of a proficiency in the formal essay, research methods, technical writing, and presentation skills are emphasized. Areas of study are based on the Common Core State Standards.

English 11-UCSI

The course stresses critical thinking, reading, writing, speaking, technical writing, and presentation skills. Students examine the influence of writers on society and society's influence on writers. Anchor texts are those of canonical British writers. Students compose a variety of analytical essays and writing of a technical nature. Texts relevant to their CSI path of study and workplace experience are incorporated and cross-curricular application of skills is required. Areas of study are based on the Common Core State Standards.

English 12-UCSI

The course stresses critical thinking, reading, writing, speaking, technical writing, and presentation skills. Students examine the influence of writers on society and society's influence on writers. Students compose a variety of analytical essays and writing of a technical nature. Anchor texts are those of canonical writers representative of various world cultures. Texts relevant to their CSI path of study and workplace experience are incorporated and cross-curricular application of skills is required. Areas of study are based on the Common Core State Standards.

Geometry 9-UCSI

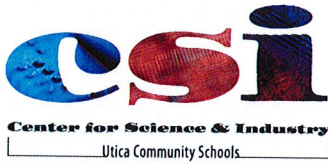
This course stresses the development of analytic and apacial reasoning skills. Work will include experiences and activities that foster in students a feeling for the value of geometry in their lives. Emphasis will be placed on applications to the worplace and everyday life and on connections to other brances of mathematics and other curricular areas. Students will use manipulaties to enhance the understanding of geometric concepts and terminology. Students will be encouraged to develop conjectures by inductive processes using manipulative and computer software such as Geometer's Sketchpad. Areas of study are based on the Common Core State Standards.

Algebra II-UCSI

Algebra II topics are based on the Common Core State Standards and include continued study of function families including the following: quadratic, polynomial, radical, rational, exponential, and lograithmic functions. The topic of conic sections fuses algebra with geometry. Units of study include sequences and iteration as well as univariate statistical applications and trigonometry. Students will develop and understanding that algebraic thinkign is an accessible and powerful tool that can be used to model and solve real-world problems. The use of manipulatives and graphing calculators is embedded in the course.

Accelerated Algebra II-UCSI

Algebra II topics are based on the Common Core State Standards and include continued study of function families including the following: quadratic, polynomial, radical, rational, exponential, and lograithmic functions. The topic of conic sections fuses algebra with geometry. Units of study include sequences and iteration as well as univariate statistical



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applications and trigonometry. Students will develop and understanding that algebraic thinkign is an accessible and powerful tool that can be used to model and solve real-world problems. The use of manipulatives and graphing calculators is embedded in the course. This rigorous course moves more rapidly and studies the topics in greater detail than in regular Algebra II.

Accelerated Precalculus-UCSI

Accelerated Precalculus is the preparation for AP Calculus or college level Calculus I course. The study of the topics, concepts, and procedures of Accelerated Precalculus deepens students' understanding of algebra and extends their ability to apply algebra concepts and procedures at higher conceptual levels, as a tool, and in the study of other subjects. Topics include functions, exponential and logarithmic functions, quadratic functions, polynomial functions, rational functions and difference quotients, systems of equations, sequences, series, mathematical induction, parametric equations, and conic sections. New mathematical tools, such as vectors, matrices, polar coordinates, limits and derivatives are introduced. Limit theory will be introduced in this course. Use of the graphing calculator and other instructional technology is embedded in the course.

Advanced Placement Calculus AB-UCSI

The topics of instruction in AP Calculus AB focus on differential and integral calculus including: functions, graphs and limits, derivatives, and integrals. Problems are explored from multiple viewpoints including, algebraic, numerical, and graphical. Problem solving is developed throughout the course with an emphasis on practical applications. Students have the opportunity to take the Advanced Placement Calculus AB Examination for possible college credit. Graphing calculators are required for the AP tests.

Principles of Design 9-UCSI (inclusive of previously titled "CSI-Technical Illustration 9")

The first semester provides a foundation in design and creative thinking for all students in the Utica Center for Science and Industry(CSI). This course addresses art history, elements and principles of design, art criticism, the artistic/creative process, learning styles, drawing theory, geometry in art, understanding light, color theory, and three-dimensional planning and modeling. Several sources will be referenced such as but not limited to Betty Edwards, Howard Gardner, and Gordon Lawrence.

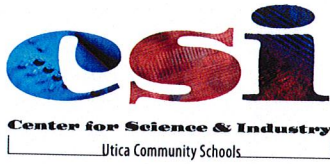
The second semester provides a foundation in industrial design using Computer Aided Design (CAD) software. The course addresses fundamental drafting/CAD standards in 2D (sketching, measuring, lettering, dimensioning, etc.) and 3D (creating solid models, performing Boolean operations, and manufacturing of objects) utilizing industry standard hardware and software.

Digital Media 10-UCSI

CSI Digital Media is a comprehensive course in the field of digital communications. It combines many of the learning objectives found in the current UCS courses Filmmaking and CTE Visual Technology. This accelerated course will guide CSI students interested in multimedia through the fundamental principles of digital technology and workflows used in industry today. Students will have the opportunity to learn these concepts and skills in a project intensive environment. From basic elements and principles of design to complex software processes, students use their critical thinking and technological aptitude to complete real-world tasks and develop transferable skills.

Principles of Electronics 10-UCSI

Introduction to Electronics is a comprehensive course in the field of electronics. A combination of Introductory and Advanced Electronics, this accelerated course will guide students through the fundamental principles and ideas of different levels of electronics used in today's industry applications. Students will have the opportunity to explore electronics from an industry perspective. This course is project intensive. From basic electronic principles to complex circuit and system designs students use their critical thinking skills to complete project tasks.



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Engineering Technology I 11-UCSI

The purpose of this course is to increase students' knowledge of the different engineering disciplines. This course will be delivered over two semesters, and will introduce high school students to some of the tools and methods used by engineers in industry. The cornerstone of the course is a semester design project, which will be completed during the second semester of the course. Successful completion of this course may qualify students for articulated college credit.

Engineering Technology II 12-UCSI

The purpose of this course is to increase students' knowledge in a specific engineering discipline that was introduced in Engineering and Technology I-UCSI. This course will emphasize the development of research skills, along with allowing for students to use other specific tools and methods that are a part of a specific engineering field. Engineering and Technology II focuses on a capstone project that is designed and developed by the student over the entire school year. Successful completers of this course may qualify for articulated college credit. Seniors may choose to take this as a two-hour block because Engineering Technology II fulfills the state and district requirement of a "senior math-related experience".

Mechatronics I 11-UCSI

This course is designed for students who have committed to exploring the field of Automated Technologies. The various disciplines explored include: robotics, sensor technology, AC and DC electronics, pneumatics, programmable logic control, and computer logic. Students will receive hands on training using state-of-the-art trainers coupled with computer-based curriculum. The class contains numerous projects that integrate these various disciplines. Successful completion of this program may qualify students for articulated college credit.

Mechatronics II 12-UCSI

This course is the capstone for the automated technologies curriculum learned in Mechatronics I-UCSI. The students will integrate the technologies of robotics, sensor technology, AC and DC electronics, pneumatics, programmable logic control, and computer logic to more advanced, real-world projects. Successful completion of this program may qualify students for articulated college credit. Seniors may choose to take this as a two-hour block because Mechatronics II fulfills the state and district requirement of a "senior math-related experience".

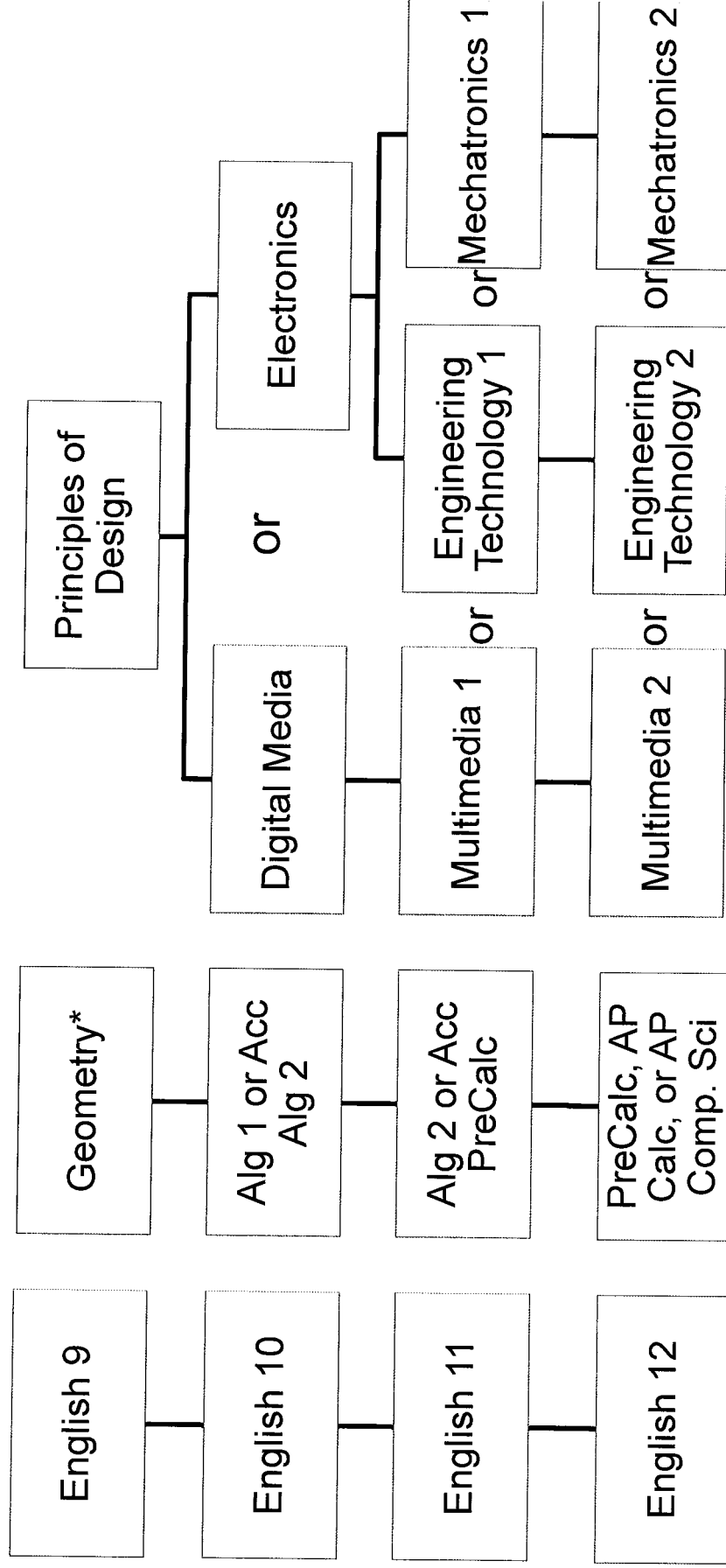
Multimedia Production I 11-UCSI

Multimedia Production I-UCSI is a course for UCSI students who wish to pursue a career in new media or to enhance their technological skills in areas such as film production, graphic design, computer illustration, and multimedia. The skills learned in this class can be the foundation for those interested in game design, fashion design, interior design, or animation programs in college. Units of study include elements and principles of design, digital photography, digital imagery manipulation, text design, digital print layout, computer illustration, film production, video graphics, visual effects, and DVD authoring for portfolio compilation. Students will use industry level software including the Final Cut Pro Studio Suite, AutoDesk Maya, plus Adobe products. Students gain experience by competing in a variety of print and video competitions. Successful completion of this course may qualify students for articulated college credit.

Multimedia Production II 12-UCSI

Multimedia Production II-UCSI is a capstone course for UCSI students, enhancing the skills learned in Multimedia Production I-UCSI. These students will specialize in one of the new media areas such as film production, radio/television production, graphic design, computer illustration, multimedia, gaming design, or animation. They will then focus on completing projects for entrance into student competitions and to develop their portfolio.. Students will continue to sharpen their skills using industry level software including the Final Cut Pro Studio Suite, AutoDesk Maya, plus Adobe products such as Photoshop, Illustrator, In-Design, and After Effects. Career exploration and preparation for post-secondary training will also be a focus of this course. Successful completion of this course may qualify the student for articulated college credit. Seniors may choose to take this as a two-hour block because Multimedia Production II fulfills the state and district requirement of a "senior math-related experience".

Four Years of CSI

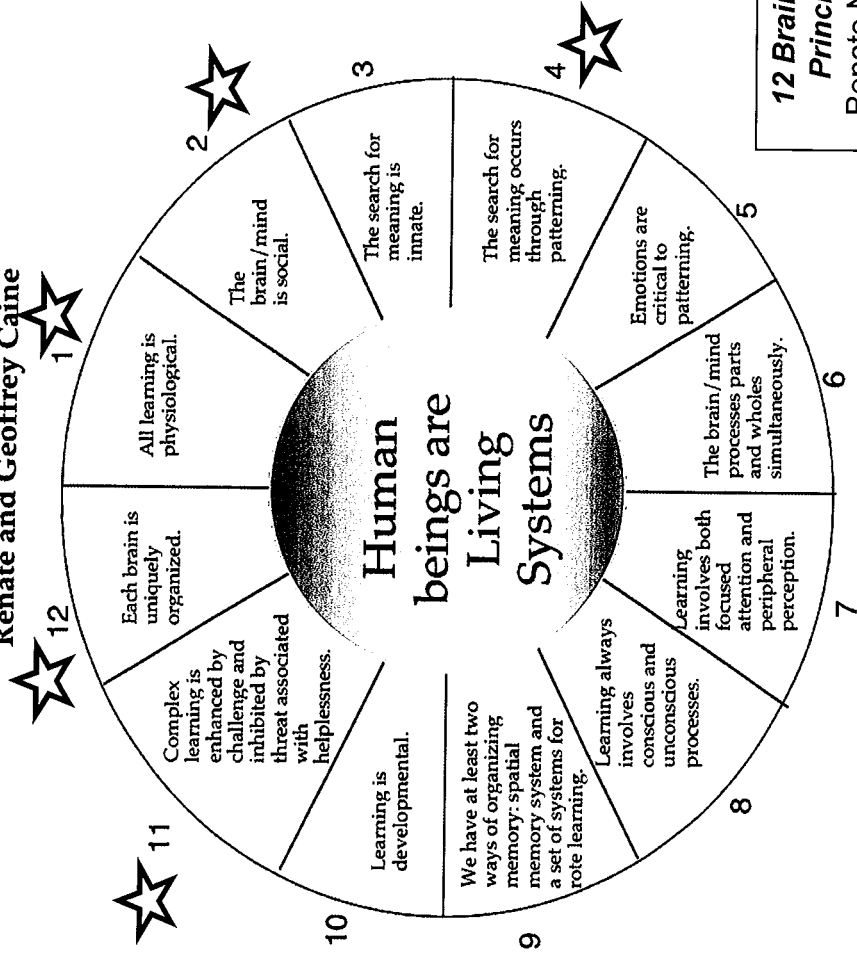


**Already had Geometry? You'll take AP Computer Science
 Work-based learning experiences throughout
 Portfolio/resume development in 11th/12th*

Environment,
and
instructional
practices
are based on
how the brain
learns best.

12 Natural Learning
Principles (LP 1-12)

The Brain/Mind Learning Principles
Renate and Geoffrey Caine

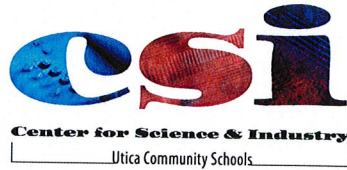


12 Brain/Mind Principles
Renate Numella Caine, Geoffrey Caine, Garol McClintic, Karl Klimek

Three interactive elements emerging out of the principles

★ Relaxed Alertness Orchestrated Immersion in Complex Experience Active Processing

© Caine and Caine, 2000



Frequently Asked Questions-General

1. What is the Center for Science and Industry?

The Center is a place that provides a rigorous academic program for students who want a career in technology, while allowing them to see the “why” and relevance of their high school course work. It is a half-day program, with seniors and freshmen attending in the morning, sophomores and juniors attending in the afternoon.

2. What programs are offered?

Course work begins with a two-year preparation for ninth and tenth graders, who will attend the Center for a portion of the school day. Regardless of their specific course of study, all ninth graders will take a 40 week elective in creative and technical design called CSI Design Principles. They will also take CSI English 9, and CSI Geometry, unless they are two years advanced in mathematics, at which point they would take AP Computer Science instead.

Tenth graders will choose one of the three disciplines and take an elective course to prepare them for entry into study for Engineering Technology, Mechatronics or Multi-Media Technology. All tenth graders will also take English 10 and either Algebra I or Accelerated Algebra II. In eleventh grade, students will again take math (Algebra II or Accelerated Pre-Calculus) and English plus their elective course: Multimedia I, Mechatronics I, or Engineering Technology I). In their senior year, students will take English, may choose to take math (AP Calculus A/B or Pre-Calculus) and one to two hours of their elective course, Multimedia I, Mechatronics II, or Engineering Technology II.

3. What is Mechatronics?

Mechatronics blends the applications of mechanical, electronics and software engineering, resulting in improved automated systems. In the professional world, Mechatronics is used in the fields of industrial robotics, engineering, and a variety of other occupations.

4. Other than specific course work, what are the advantages for my student to attend the Center?

Our program is highly collaborative and creative, and graduates report that the skills they’ve learned at CSI, including how to work successfully on a team and apply what they’ve learned to real-world situations, is a tremendous benefit to their college studies. Additionally, students will have access to work-based learning opportunities at all levels, including guest speakers, off-site industry tours, job shadowing, mentoring and work-site internships.

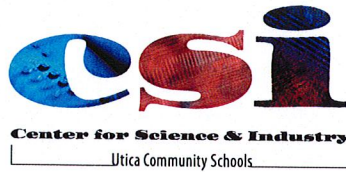
5. Since this is a half-day program, will transportation be provided?

Yes. Students will take the neighborhood *high school bus* to their home high school, where they will take a shuttle bus to the Instructional Resource Center. At the end of their CSI classes, they are transported back to their home high school or junior high.

6. What is the application process?

Students can only apply and be accepted in eighth grade, as students begin CSI as ninth graders. Specific application information for current eighth grade students interested in applying for the upcoming school year will be available on the CSI website, <http://csi.uticak12.org>, beginning in December of the current school year.

When they apply, students will select one of two testing dates in January. Students will take an aptitude test in reading, mathematics, and will write an essay. Scores from these tests, as well as information from the application, are entered into a rubric.



7. What if there are more applications than the 90 available seats?

Students will be selected through a lottery process from among qualified applicants based on the above mentioned rubric.

8. If my student enrolls in the Center for Science and Industry and later wants to return to the regular school district program, will that be allowed?

As a student of the Utica Community Schools, your student will be welcomed back into the regular school program, with increased knowledge and possessing a background of academic rigor and technological achievement. We do ask that you make the decision to join carefully, as each year we have a wait list of students.

9. How is CSI different from the home high schools?

The CSI elective classes of Mechatronics, Engineering Technology, and Multimedia Production are unique to our program. Additionally, while the “what” we teach in English and mathematics is the same school board approved curriculum as is taught in all Utica Community Schools’ high schools, the “how” we teach to those standards may be different. We apply the brain/mind learning principles to create an active and engaging learning environment known as “relaxed alertness.” That means that students learn in a climate of “high challenge, low threat.” CSI also incorporates open-ended projects with “real world” applications. These projects allow the students to apply and expand their knowledge while refining communication, presentation, and teamwork skills.

10. What are the hours that students attend CSI?

9th and 12th grade students attend CSI from 7:45 a.m.-10:30 a.m.

10th and 11th grade students attend CSI from 11:05 a.m.-1:40 p.m.

11. What if I have questions about the CSI program?

Please email CSI Lead Teacher, Jill Riley, at jill.riley@uticak12.org.



Frequently Asked Questions - Freshmen “Accelerated” or “Honors” Classes

As stated in all of our informational presentations for parents and students, there are no 9th grade courses called “CSI Accelerated Geometry” or “CSI Honors English”. Here is a detailed explanation:

1. Why don’t you offer these classes?

Like every school in the district, when building our schedule we must maintain a certain teacher-to-student ratio. To maintain this ratio, sections (classes) must have a certain number of students enrolled in order to run. Even if we wanted to offer an “Accelerated Geometry” and/or “Honors English”, we would have to set quotas and accept students in an advanced track *only if* we had enough for full sections. For example, we could never accept 45 students who want “Accelerated Geometry” because we cannot have a class of 45 students (we also cannot split 45 students into two sections). Likewise, as another example, we would have to turn away 20 students who want “Honors English” because that’s not enough for a full section. In addition, we do not think a student should be denied or admitted to CSI based on which math or English class he/she has had. (Our current admittance criterion of “grade level” math and English is simply because we do not have additional support staff for students who haven’t demonstrated proficiency in 8th grade core classes.)

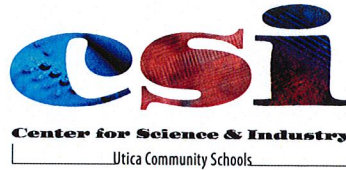
Additionally, because of our electives and different required mathematics courses, our schedule for grades 10-12 is very difficult to build within staffing constraints. In order to provide students their necessary elective and math course, we are already sometimes forced to run smaller sections. The ratio is, therefore, maintained by running other sections at, or in many cases above, their suggested cap. Adding yet another limitation to this schedule building process (in the form of an “honors” English course), would likely make it an impossible schedule to run.

2. Aren’t you hurting my “accelerated” student by putting him in a class with “regular” students?

No. We hear from parents, students, administrators, and curriculum experts that the rigor in our “regular” CSI classes is comparable to the rigor in accelerated or honors courses. The caliber of discussions our students have about the content, as well as our focus on their ability to apply their knowledge to practical situations is what honors classes should strive for, and is what the newly implemented Common Core State Standards demand. In fact, for example, the opportunities for challenge offered in Geometry are often the exact same activities required of “Accelerated Geometry” students at any of our schools. It is expected that at CSI “accelerated” student take advantage of each challenge opportunity (and “regular” students are encouraged to do so as well!).

Perhaps one CSI Alumni, and current Kettering University student, says it best in this excerpt from a recent email (this student was an “accelerated” math student who had “regular” CSI Geometry, as most of our freshmen have had, with the exception of those who are two years advanced in math):

I keep finding more and more assignments, ideas, and discussions paralleling what we do (or you do, now, I suppose) at CSI and what we do here at Kettering...I am accelerating through my Calculus 3 course with ease due to my background in math. All the algebra skills and trig identities we were forced to memorize are coming back to help me, especially since I can't use my calculator. My Chemistry professor was telling us how she sees that multiple choice tests are not always an effective way to assess one's knowledge, and that we can so choose another form of assessment ([geometry teacher] this makes me think of you). I just wanted to encourage you all and let you all know that what it is you're doing is real life. I'm practicing it every day at college. I'm living it. And people are astonished that I understand what they're saying as a "week old" freshman. So if you could please share this with the CSI students and parents, I'd greatly appreciate it.



3. Then why are some freshmen able to take AP Computer science instead of Geometry?

Students who are two years (or more) accelerated in math have already taken and demonstrated proficiency in Geometry. We do not think asking them to repeat a course will provide them the optimal learning situation; the AP Computer Science provides a challenging opportunity for them to earn another math credit and does not ask them to repeat a course. This course has been able to run because both freshmen and seniors enroll.

4. Why does my child say he is “behind” his peers at his home school who are in accelerated classes?

All Utica Community Schools Geometry classes and English classes have the same pacing guide and take the same end-of-course assessments (midterm & final exam). The pacing guide outlines the curriculum and serves as a suggested time frame for teaching the required material. All Geometry and English teachers teach the same core content. To expect that, on any given day, all Geometry or English classes in the district will be on the same “page” is simply an unrealistic, and unwise, expectation. Additionally, CSI incorporates many additional projects, some cross-curricular, which take time and add greatly to the students learning experience. Be assured that all required material, plus much additional material and many additional projects, will be completed.

5. Won't my accelerated child be bored in a regular class? Research shows that boredom leads to low motivation levels.

Our students and parents frequently compliment the CSI staff on their ability to engage students. From time to time, your child may feel as though something is more “review” than new learning; this is perfectly normal and to be expected as teachers work to assure that all topics are understood with depth and clarity and have been truly *learned*. Likewise, we expect CSI students to work to help their teachers provide them with necessary level of challenge; this includes students speaking up if something seems “too easy” for too long, taking advantage of any challenge opportunity provided, and, in some cases, creating a challenge for themselves. Our most outstanding students are those who look to go above and beyond, even when not told to do so.

6. What happens to my accelerated math student in 10th grade?

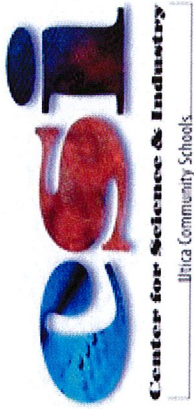
Provided that the student has demonstrated mastery of Algebra I and Geometry concepts by passing the courses, the student will be enrolled in an Accelerated Algebra II course in 10th grade, Accelerated Pre-Calculus in 11th grade, and AP Calculus A/B in 12th grade (pending student and parent choice).

7. So there are some AP classes at CSI?

Each year's schedule is dictated by student need. This year (2014-15) we have AP Calculus A/B and AP Computer Science, both offered in the morning. We plan to continue to offer these classes, but they can only run (as explained above) with sufficient numbers of students. Many of our students take advantage of AP offerings at their home schools and therefore get the challenges and benefits of both the CSI program and AP classes.

8. What options do I have if I still want my child enrolled in “Accelerated Geometry”?

We are committed to working with students to provide a rigorous experience at CSI, but if the transcript designation of “Accelerated” or “Honors” for 9th grade is a *must have*, then choosing one's home junior high or high school may be your child's best option. While we hope you see the value of the CSI program and want to be a part of it, Utica Community Schools offers tremendous opportunities and your child will receive a high-quality education in any of our schools.



Discover CSI! Just as we encourage our students to learn through experience, we invite you to explore CSI and discover what we are all about. Please use the map and accompanying checklists to help you see why we are such a unique program.

