

CENTER FOR SCIENCE AND INDUSTRY (CSI) DEPARTMENT



Arts &
Communications



Business, Management
Marketing & Technology



Health
Science



Engineering/Manufacturing
& Industrial Technology



Human
Services



Natural Resources
& Agriscience

VPAA – Meets Visual, Performing & Applied Arts Requirement

OLE – Meets Online Learning Experience Requirement

GR/MMC – Meets Graduation Requirements based on Michigan Merit Curriculum

SMR – Senior Math Related

ENGLISH 9 – CSI – T-B020	9	1.0 credit
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 is and annotated research is part of the required work in this course.		

ENGLISH 10 – CSI – T-B040	10	1.0 credit
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 CSI. Cross-curricular application of skills, demonstration of a proficiency in the formal essay, research methods, technical writing and presentation skills are emphasized.		

ENGLISH 11– CSI – T-B060	11	1.0 credit
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. Texts relevant to their CSI path of study and workplace experience are incorporated and cross-curricular application of skills is required.		

ENGLISH 12– CSI – T-B080	12	1.0 credit
Starting with the 2011-2012 school year 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. Texts relevant to their CSI path of study and workplace experience are incorporated and cross-curricular application of skills is required.		

ALGEBRA I – CSI – T-E090

10-11

1.0 credit

PREREQUISITE: Acceptance into the Center for Science and Industry and successful completion of CSI Geometry

It is expected that students entering Algebra I are able to recognize and solve mathematical and real-world problems involving linear relationships and to make sense of and move fluently among the graphic, numeric, symbolic, and verbal representations of these patterns.

Algebra 1 topics are based on the Michigan High School Content Expectations and include the study of families of functions including linear, quadratic, polynomial, exponential, rationals, and bivariate data analysis. Students will also develop their knowledge of power (including roots, cubics, and quartics). Algebra 1 draws upon and connects to topics related to numbers and geometry by including the formalized study of the real number system and its properties, and by introducing elementary number theory. The use of manipulative and graphing calculators is embedded in the course. Work will include applications to the work place and everyday life. Students will also see connections to other curricular areas.

GEOMETRY 9 – CSI – T-E100

9

1.0 credit

PREREQUISITE: Acceptance into the Center for Science and Industry

Geometry builds on a number of key geometric topics developed in the middle grades, namely relationships between angles, triangles, quadrilaterals, circles, and simple three-dimensional shapes. It is expected that students beginning Geometry are able to recognize, classify, and apply properties of simple geometric shapes, know and apply basic similarity and congruence theorems, understand simple constructions with a compass and straight edge, and find area and volume of basic shapes.

This course stresses the development of analytic and spatial 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 work place and everyday life and on connections to other branches of mathematics and other curricular areas. Students will use manipulative 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. Cooperative learning groups are used to allow students to become proficient in analyzing conjectures and in formulating proofs. Areas of study are based on the Michigan High School Content Expectations and include: logic, proof, two dimensional and three dimensional figures, right triangle trigonometry, algebraic reasoning applied to geometric situations, transformational geometry, and coordinate geometry.

ALGEBRA II – CSI – T-E120

10-11

1.0 credit

PRE-REQUISITES: Acceptance into the Center for Science and Industry, CSI Geometry, and CSI Algebra I

Algebra II topics are based on the Michigan High School Content Expectations and include continued study of function families including: quadratic, polynomial, radical, rational, exponential, and logarithmic 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 an understanding that algebraic thinking is an accessible and powerful tool that can be used to model and solve real-world problems. The use of manipulative and graphing calculators is embedded in the course. Work will include applications to the work place and everyday life. Students will also see connections to other curricular areas.

ACCELERATED ALGEBRA II – CSI – T-E130

10

1.0 credit

PRE-REQUISITES: Acceptance into the Center for Science and Industry, CSI Geometry, and CSI Algebra I

Algebra II topics are based on the Michigan High School Content Expectations and include continued study of function families including: quadratic, polynomial, radical, rational, exponential, and logarithmic 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 an understanding that algebraic thinking is an accessible and powerful tool that can be used to model and solve real-world problems. This rigorous course moves more rapidly and studies the topics in greater detail than in regular Algebra II. The use of manipulative and graphing calculators is embedded in the course. Work will include applications to the work place and everyday life. Students will also see connections to other curricular areas.

ACCELERATED PRECALCULUS-CSI (GR/MMC) – T-E157

11, 12

1.0 credit

PREREQUISITE: Acceptance into the Center for Science and Industry, successful completion of Algebra II-CSI or Accelerated Algebra II-CSI, and teacher recommendation

Accelerated Precalculus-CSI is the preparation for AP Calculus, or a 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. The theory and application of trigonometry and functions are developed in depth. 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. Students will research applications in the work place and everyday life. Students will also see connections to other curricular areas.

MANDARIN I – CSI – T-F410

9

1.0 credit

The Mandarin Chinese I (IB) course is a yearlong course available to students who will be attending the Utica Academy of International Studies. The focus of this course is to offer students a rigorous introductory level course that will allow them to develop proficiency in reading, writing, speaking and listening in Mandarin Chinese. Students will begin to explore the culture of China as well as its geography, history, and current events. Students will also explore the culture as it is interwoven through language and literature lessons. In addition, this course is meant to prepare students for the next course in the sequence, Mandarin Chinese II.

MANDARIN II – CSI - T-F420

10

1.0 credit

The Mandarin Chinese II (IB) course is a yearlong course available to students who will be attending the Utica Academy of International Studies. The focus of this course is to offer students a rigorous course that will allow them to develop proficiency in reading, writing, speaking and listening in Mandarin Chinese. This course will build on studies and curriculum beginning in Mandarin I and will expand Chinese cultural and linguistic awareness and aptitude. Students will continue exploration of Chinese culture, geography, history, and current events. Students will also explore the culture as it is interwoven through language and literature lessons. In addition, this course is meant to prepare students for the next course in the sequence, IB Language B Mandarin SL.

PRINCIPLES OF ELECTRONICS-CSI - T-I185 10 1.0 credit

PREREQUISITE: Acceptance into the Center for Science and Industry

CSI Principles of Electronics is a comprehensive pilot course in the field of electronics. It combines many of the learning objectives found in the current UCS courses *Introduction to Electronics* and *Advanced Electronics*. This accelerated pilot course will guide CSI students interested in engineering and mechatronics through the fundamental principles of electronics used in industry today. Students will have the opportunity to learn these concepts and skills in a project intensive environment. From basic electronic principles to complex circuit and system design, students use their critical thinking and mathematical aptitude to complete real-world tasks and develop transferable skills.

PRINCIPLES OF DESIGN 9-CSI (VPAA) – T-L018 9 .5 credit

PREREQUISITE: Acceptance into the Center for Science and Industry

This is a semester course which provides a foundation in creative design for all students in the 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 Gardener, and Gordon Lawrence.

DIGITAL MEDIA-CSI – T-L600 10 1.0 credit

PREREQUISITE: Acceptance into the Center for Science and Industry

CSI Digital Media is a comprehensive pilot 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 pilot 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.

ENGINEERING TECHNOLOGY I-CSI (VPAA) (SMR) – T-V460 11 1.0 credit

PREREQUISITE: Acceptance into the Center for Science and Industry and Principles of Electronics-CSI

The purpose of this Center for Science and Industry 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-CSI (VPAA) (SMR) - T-V462 Starting with 2011-2012 school year 12 1.0 credit

PREREQUISITE: Acceptance into the Center for Science and Industry, Principles of Electronics-CSI, and Engineering Technology I-CSI

The purpose of this Center for Science and Industry course is to increase students' knowledge in a specific engineering discipline that was learned in Engineering and Technology I-CSI. 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.

MECHATRONICS I-CSI (SMR) – T-V525 11 1.0 credit

PREREQUISITE: Acceptance into the Center for Science and Industry and Principles of Electronics-CSI

This Center for Science and Industry course is designed for male and female 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 student for articulated college credit.

MECHATRONICS II-CSI (SMR) – T-V526 Starting with the 2011-2012 school year 12 1.0 credit

PREREQUISITE: Acceptance into the Center for Science and Industry, Principles of Electronics-CSI, and Mechatronics I-CSI

This Center for Science and Industry course is designed as a capstone for the automated technologies curriculum learned in Mechatronics I-CSI. 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 student for articulated college credit.

TECHNICAL ILLUSTRATION 9-CSI – T-V542 9 .5 credit

PREREQUISITE: Acceptance into the Center for Science and Industry

CSI Technical Illustration 9 is a semester course that 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. These design skills are then applied to real world situations through cross-curricular projects using Ford Partnership for Advanced Studies educational resources.

MULTIMEDIA PRODUCTION I-CSI (VPAA) (SMR) – T-V550

11

1.0 credit

PREREQUISITE: Acceptance into the Center for Science and Industry and Digital Media-CSI

Multimedia Production I-CSI is a course for Center for Science and Industry 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 multi media. The skills learned in this class can also be the foundation of those who are interested in gaming 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 such as Photoshop, Illustrator, In-Design, and After Effects. Researching a career of interest will include contacting and interviewing a professional in the industry. Students gain experience by competing in a variety of print and video competitions. Participation in SkillsUSA allows students to compete in their skill area as well as learn and practice leadership skills and techniques. Successful completion of this course may qualify the student for articulated college credit.

MULTIMEDIA PRODUCTION II-CSI (VPAA) (SMR) – T-V552 Starting with the 2011-2012 school year

12

1.0 credit

PREREQUISITE: Acceptance into the Center for Science and Industry, Digital Media-CSI, and Multimedia Production I-CSI

Multimedia Production II-CSI is a capstone course for Center for Science and Industry students, enhancing the skills learned in Multimedia Production I-CSI. 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. Participation in SkillsUSA will allow students to compete in their skill area as well as learn and practice leadership skills and techniques. Successful completion of this course may qualify the student for articulated college credit.