



## High School Course Guide

### Technology Applications Course Descriptions

**91820 Computer Science I (H) (DC)**

**1 credit**

**Gr: 9-12**

**91823 Computer Science I (DC)**

**Prerequisite:** Algebra 1

**Description:** Computer Science I will foster students' creativity and innovation by presenting opportunities to design and implement programs using the Java programming language. After learning basic concepts, students will have the opportunity to create meaningful projects, including programs for mobile computing devices. Students will collaborate with one another and their instructor to solve the problems presented throughout the course. This course is intended to begin preparation of college-bound students in the evolving discipline of computer science. Students will also gain an understanding of the principles of mobile application development through the study of development platforms, programming languages, and software design standards. This course can serve both as an introductory course for potential computer science majors and as a foundation course for students planning to study in other fields that significantly involve computing.

**NOTE:** 91823 Computer Science I is for P-TECH program at Rowlett HS only.

**92821 AP Computer Science A**

**2 credits**

**Gr: 10-12**



**Prerequisite:** Computer Science I

**Description:** This college-level course reinforces and increases the depth of understanding of the basic concepts and covers advanced programming concepts which are useful in preparation for the Computer Science Advanced Placement tests. The AP Computer Science II emphasizes object-oriented programming methodology with a concentration on problem solving and algorithm development and is meant to be the equivalent of a first-semester college-level course in Computer Science. The Java programming language is currently taught in this course. Students will learn to become responsible digital citizens by researching current laws and regulations and by practicing integrity and respect throughout the AP Computer Science II course. \*AP courses address learning objectives at greater depth and faster pace along with higher expectations for student performance. Upon successful completion of the course, students will earn one credit of math and one credit of LOTE.

**91824 Computer Science III (H)**

**1 credit**

**Gr: 11-12**

**Prerequisite:** AP Computer Science A, or IB Computer Science

**Description:** Computer Science III will foster students' creativity and innovation by presenting opportunities to design, implement, and present meaningful programs through a variety of media. Through data analysis, students will identify task requirements, plan search strategies, and use computer science concepts to access, analyze, and evaluate information needed to solve problems. By using computer science knowledge and skills that support the work of individuals and groups in solving problems, students will select the technology appropriate for the task, synthesize knowledge, create solutions, and evaluate the results. Students will gain an understanding of advanced computer science data structures through the study of technology operations, systems, and concepts in a collaborative learning environment.

**92818 Computer Science I (IB)**

**1 credit**

**Gr: 9-12**



**Prerequisite:** Algebra I (H)

**Description:** [International Baccalaureate course offered only at GHS] This course is intended to prepare college bound students in the evolving discipline of Computer Science, and also serves as the introductory course for students on the IB track. It is designed to introduce students to fundamental programming concepts with an emphasis on problem solving skills. The course teaches computing system fundamentals, programming methodology, algorithm selection and analysis, use and design of appropriate data structures, the software development lifecycle, and the fundamentals of object oriented programming using the Java programming language. This course covers most of the common core for the IB Standard Level (SL) Computer Science exam. This class also provides the student with an introduction to independent project development. This course can count as a credit toward the LOTE graduation requirement.

NOTE: All courses may not be offered on every campus.

**92828 Computer Science II (IB)****2 credits****Gr: 10-12****Prerequisite:** Computer Science I (IB)

**Description:** [International Baccalaureate course offered only at GHS] This course continues the study of Computer Science from the first year, and is designed to prepare students for the IB Standard Level (SL) and Higher Level (HL) Computer Science exams. Emphasis is on advanced computing system fundamentals and object oriented programming techniques, file organization, computational mathematics and logic, abstract data structures, further study of software development lifecycles, expanded coverage of Java libraries, and in-depth analysis of algorithms, sorts, and searches (including "Big O" analysis). This class also provides for extensive independent project development, with time specifically devoted to IB test preparation, IB dossier design, and extended essay mentoring. Students are required to complete an IB dossier. Upon successful completion of the course, students will earn one credit of math and one credit of LOTE.

**91822 AP Computer Science Principles****1 credit****Gr: 9-12****Prerequisite:** Algebra I

**Description:** AP Computer Science Principles introduces students to the central ideas of computer science, instilling the ideas and practices of computational thinking and inviting students to understand how computing changes the world. The rigorous course promotes deep learning of computational content, develops computational thinking skills, and engages students in the creative aspects of the field. The course is unique in its focus on fostering students' creativity. Students are encouraged to apply creative processes when developing computational artifacts and to think creatively while using simulations to explore questions that interest them. Rather than teaching a particular programming language or tool, the course focuses on using technology and programming as a means to solve computational problems and create exciting and personally relevant artifacts. Students design and implement innovative solutions using an iterative process similar to what artists, writers, computer scientists, and engineers use to bring ideas to life.

**91839 Digital Design and Media Production (R)****1 credit****Gr: 9-12****91843 Digital Design and Media Production (DC)****Prerequisite:** None

**Description:** This course blends the skills and critical thinking of traditional journalism with digital media and publishing. Students will demonstrate creative thinking, develop innovative strategies, and use communication tools in order to work effectively with others as well as independently. Students will solve problems and make informed decisions regarding media projects, as well as learn and practice digital citizenship for the 21st century.

**NOTE:** 91843 Digital Design and Media Production (DC) is for P-TECH Program at Sachse HS only.

**91835 Digital Video & Audio Design (R)****1 credit****Gr: 11-12****Prerequisite:** None

**Description:** Digital Video & Audio Design (DVAD), is the fusion of creative and intellectual skills with technological innovations to create interactive and participatory media products. It connects traditional journalism skills and ethics with expertise in video production, audio mastering, podcasting, and convergent media packages for the web. A strong foundation in production methods including pre-production, production, and post-production will be developed. This course incorporates project-based and cooperative learning to develop the next generation of writers and news media entrepreneurs. Software such as Audacity, Apple iMovie, Final Cut Pro, Sony Movie Studio, and other video editing software will be utilized throughout the course.



## High School Course Guide

### Technology Applications Course Descriptions

**91836 Game Programming and Design (R) (DC)**

**1 credit**

**Gr: 9-12**

**91844 Game Programming and Design (DC)**

**Prerequisite:** Algebra I

**Description:** Game Programming and Design will foster student creativity and innovation by presenting students with opportunities to design, implement, and present video games. Students will collaborate with one another and their instructor to solve gaming problems. Using the GameMaker Pro with beginner algorithms and coding, students will develop increasingly complex video games throughout the year. The students will learn 2D and 3D gaming concepts. Students will use programs such as Fireworks and Photoshop to develop graphics for their games and Audacity to record and edit audio files needed for game development.

**NOTE:** 91844 Game Programming and Design (DC) is for P-TECH Program at Rowlett HS only.

**91837 Independent Study in Evolving/Emerging Technologies (R)**

**1 credit**

**Gr: 10-12**

**Prerequisite:** Digital Video & Audio Design

**Description:** Through the study of evolving/emerging technology, students learn to make informed decisions and develop original work. All original work will be published using multiple formats including text, image, video and audio files. By understanding evolving/emerging technology, students will learn to select the technology appropriate for the task. Advanced creativity, innovation and collaboration will be used throughout the course. Critical thinking skills will be engaged to plan and conduct research, manage projects, solve problems, and make informed decisions on the appropriate digital tools and resources. This independent study allows students who have completed one year in Digital Video & Audio Design to continue the course content for an additional year.

**91811 Independent Study in Technology Applications: Ready 1:1 Student Support (R) 1 credit**

**Gr: 10-12**

**91812 Independent Study in Technology Applications (DC)**

**Prerequisite:** None

**Description:** The Ready 1:1 Student Support course blends the four C's of 21st century learning, critical thinking, communication, collaboration, and creativity with the technological innovations to create technology infused products. This course enhances the student's ability to use cloud-based tools to create and share documents, spreadsheets, presentations, videos and other files. The course also incorporates project-based and cooperative learning to develop global leaders. Students will work collectively with peers to create products such as classroom sites, blogs, video and audio communication material using tools available in G Suite for Education and more. Software such as G Suite, iWork, Canva, Pikto-chart, Adobe Spark Post, Adobe Spark Page, Adobe Spark Video, Adobe Suite, other image and/or video editing software, and project management software will be utilized throughout the course. In addition to the above, students devote ten percent of their time to a project of their interest that benefits Garland ISD.

**NOTE:** 91812 Independent Study in Technology Applications (DC) id for P-TECH Program at Sachse HS only.

**91838 Mobile Application Development (R)**

**1 credit**

**Gr: 9-12**

**91845 Mobile Application Development (DC)**

**Prerequisite:** Algebra I

**Description:** Mobile Application Development will foster students' creativity and innovation by presenting opportunities to design, implement, and deliver meaningful projects using mobile computing devices. Students will collaborate with one another, their instructor, and various electronic communities to solve problems presented throughout the course. Through data analysis, students will identify task requirements, plan search strategies, and use software development concepts to access, analyze, and evaluate information needed to program mobile devices. By using software design knowledge and skills that support the work of individuals and groups in solving problems, students will select the technology appropriate for the task, synthesize knowledge, create solutions, and evaluate the results. Students will learn digital citizenship by researching current laws and regulations and by practicing integrity and respect. Students will gain an understanding of the principles of mobile application development through the study of development platforms, programming languages, and software design standards.

**NOTE:** 91845 Mobile Application Development is for P-TECH Program at Rowlett HS only.

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**91831 MST Digital Art and Animation (H) (DC)****1 credit****Gr: 9-12****Prerequisite:** 91819 Digital Communications or 91834 MST Digital Video, and satisfy Dual Credit enrollment criteria**Description:** [Math-Science-Technology magnet course offered only at NGHS] Digital Art and Animation, an introductory course in graphics design, typography, and imaging techniques, provides students fundamental skills necessary for college including technology terminology, concepts and strategies. Course topics include digital composition, color, imaging, graphics editing, and animation, as well as investigations into careers such as graphics design, advertising, web design, animation, character development, and game design. The student will use object oriented software applications to produce and edit digital designs and to incorporate design principles in formulating design strategies. Students will investigate additional topics including color theory, harmony rules, tints, gradients and color mixing in support of foundational art and design theory, and principles of animation. Both 2-D and 3-D animation production will be introduced, using Flash Professional, Adobe After Effects, and Maya.

\*Dual Credit courses address learning objectives at greater depth and faster pace along with higher expectations for student performance.

**91819 MST Digital Communications in the 21st Century (R)****1 credit****Gr: 9-12****Prerequisite:** None**Description:** [Math-Science-Technology magnet course offered only at NGHS] MST Digital Communications in the 21st Century provides students fundamental skills necessary for college including technology terminology, concepts and strategies. This introductory technology course will provide students a survey of essential technology skills including digital typography standards, design and layout principles, digital photography and editing, videography techniques, and the deployment of digital media for print, web and video use. Students will develop proficiency in the use of computer input devices, acquisition of information from LANs, WANs, and the internet, and the use of various file formats. Problem solving using computer-based productivity tools will be emphasized, including use of animation and scripting in multimedia products. Software used to include Photoshop, Flash Professional, Audacity, GarageBand, Final Cut Pro, and Movie Maker.**91834 MST Digital Video & Audio Design (DC)****1 credit****Gr: 9-12****Prerequisite:** Satisfy Dual Credit enrollment criteria**Description:** [Math-Science-Technology magnet course offered only at NGHS] Video and audio design are fields that continue to grow and influence not only how we interact with technology, but also how society functions in general. From You-Tube to feature films to the iPhone, digital video is intertwined with daily life. This dual credit course guides students in developing the key skills used in digital video design, from understanding the technical aspects of the video production process to more artistic considerations of video and audio editing. Topics include green screen compositing, digital special effects, Foley production and script development as well as student directed video productions. Students will investigate video and audio production for specific mediums, including mobile devices, computers and television, and the technical requirements of those mediums. Software used includes Final Cut Pro, GarageBand, Audacity, and Adobe After Effects.

\*Dual Credit courses address learning objectives at greater depth and faster pace along with higher expectations for student performance.

**91833 MST Independent Study in Technology Applications (H) DC****1 credit****Gr: 9-12****Prerequisite:** Two Technology Applications Courses**Description:** This Dual Credit Honors course focuses on authoring tools that combine media elements into an interactive information structure that communicates some form of knowledge including professional electronic portfolios. Students receive advanced training in industry standard tools used in the production of interactive CD-ROM titles, authoring of multimedia corporate appropriate presentations, and media rich web pages. Through individual and collaborative projects, students experience the process of product development from beginning to end: identification of need, definition of requirement specifications, selection of the most appropriate distribution medium, creation or location of component media, design of the product interface, construction of the

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## High School Course Guide

### Technology Applications Course Descriptions

product, and evaluation of its effectiveness. Additional studies include career investigations, interviews with professional multimedia artists, and investigation of degree programs leading to multimedia authoring careers. Software used includes Adobe Acrobat Pro, Adobe After Effects, Flash Professional, Photoshop, Dreamweaver, Premiere, and Final Cut Pro.

**91829 MST Web Design (H) (DC)**

**1 credit**

**Gr: 9-12**



**MST**

**Prerequisite:** 91819 Digital Communications and satisfy Dual Credit enrollment criteria

**Description:** [Math-Science-Technology magnet course offered only at NGHS] In this college-level course, in addition to developing introductory skills in web site design using HTML and Adobe Dreamweaver, students will also use introductory programming skills using languages such as JavaScript, PHP and ActionScript. Web-enabled database systems including SQL databases are utilized for user data acquisition and storage, e-commerce applications, and the support of collaborative systems. Topics in this dual credit course also include structure and function of the internet, optimization and bandwidth considerations, information technology career paths, rich media creation, and internet research strategies. Web server systems, domain name management, and practical site hosting issues are investigated. Software use includes Adobe Dreamweaver, Photoshop, Flash and FTP clients.

\*Dual Credit courses address learning objectives at greater depth and faster pace along with higher expectations for student performance.

**91850 Robotics Programming and Design**

**1 credit**

**Gr: 9-12**

**Prerequisite:**

**Description:** Robotics Programming and Design will foster students' creativity and innovation by presenting opportunities to design, implement, and present meaningful robotic programs through a variety of media. Students will collaborate with one another, their instructor, and various electronic communities to solve problems in designing and programming robots. Through data analysis students will identify task requirements, plan search strategies, and use robotic concepts to access, analyze, and evaluate information needed to solve problems. By using robotic knowledge and skills that support the work of individuals and groups in solving problems, students will select the technology appropriate for the task, synthesize knowledge, create solutions, and evaluate the results. Students will learn digital citizenship by researching current laws and regulations and by practicing integrity and respect. Students will gain an understanding of the principles of robotics through the study of physics, robotics, automation, and engineering design concepts.

**91830 Web Design (R)**

**1 credit**

**Gr: 9-12**

**91842 Web Design (DC)**

**Prerequisite:** None

**Description:** The purpose of this class is to teach the understanding and development of Web sites. The student will learn the HTML5 necessary to create a web page and Cascading Style Sheets (CSS) to format the content of the Web page. Software applications will be used to develop graphics, animations, audio, and video components to include in the Web sites. Students will learn to publish Web sites using a GISD provided server. Students will also learn to analyze the design, functionality, and validity of existing Web sites. Software used in this course includes Dreamweaver, Fireworks, Flash, and Textpad.

**NOTE:** 91842 Web Design (DC) is for P-TECH Program at Sachse HS only.

**91832 Independent Study in Tech Apps/Web Programming (R)**

**1 credit**

**Gr: 10-12**

**91813 Independent Study in Tech Apps/Web Programming (DC)**

**Prerequisite:** Web Design or Computer Science I

**Description:** This hands-on course teaches in-depth skills in Cascading Style Sheets (CSS), programming, database design, and web security. Students will work independently and collaboratively to design and develop sites using current technologies. Interactive Web pages will be created with a variety of different authoring tools such as JavaScript, PHP, Flash ActionScript, and advanced features of Dreamweaver. Students will have an opportunity to participate in the maintenance of their school website.

**NOTE:** 91813 Independent Study in Tech Apps/Web Programming (DC) is for P-Tech Program at Rowlett HS only.

**91840 3D Modeling & Animation (R)**

**1 credit**

**Gr: 10-12**

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## High School Course Guide

### Technology Applications Course Descriptions

**Prerequisite: 2D Modeling (CTE)**

**Descriptions:** 3-D Modeling and Animation consists of computer images created in a virtual three-dimensional (3-D) environment. 3-D Modeling and Animation has applications in many careers, including criminal justice, crime scene, and legal applications; construction and architecture; engineering and design, and the movie and game industries. Students in this course will produce various 3-D models of real-world objects. Students will be using industry standard software to learn and produce visual effects and animations as seen on television, in the movies, in games, and simulations. Students will also learn how to model buildings and structures, apply real-world physics and lighting to those models, and the process for applying kinesthetic to the human body.

**90110 Foundations of Cybersecurity (R)**

**1 credit**

**Gr: 9-12**

**Prerequisite: None**

**Descriptions:** In the Foundations of Cybersecurity course, students will develop the knowledge and skills needed to explore fundamental concepts related to the ethics, laws, and operations of cybersecurity. Students will examine trends and operations of cyberattacks, threats, and vulnerabilities. Students will review and explore security policies designed to mitigate risks. The skills obtained in this course prepare students for additional study in cybersecurity. A variety of courses are available to students interested in this field. Foundations of Cybersecurity may serve as an introductory course in this field of study.

**90980 Cybersecurity Capstone (R) - GRCTC**

**1 credit**

**Gr: 11-12**

**90985 Cybersecurity Capstone (DC)**

**Prerequisite: Foundations of Cybersecurity**

**Descriptions:** In the Cybersecurity Capstone course, students will develop the knowledge and skills needed to explore advanced concepts related to the ethics, laws, and operations of cybersecurity. Students will examine trends and operations of cyberattacks, threats, and vulnerabilities. Students will develop security policies to mitigate risks. The skills obtained in this course prepare students for additional study toward industry certification. A variety of courses are available to students interested in the cybersecurity field. Cybersecurity Capstone may serve as a culminating course in this field of study.

**91817 Web Communications (DC)**

**1 credit**

**Gr: 9-12**

**Prerequisite: None**

**Descriptions:** This is an exploratory course in web communications. The technology applications curriculum has six strands based on the National Educational Technology Standards for Students (NETS•S) and performance indicators developed by the International Society for Technology in Education (ISTE): creativity and innovation; communication and collaboration; research and information fluency; critical thinking, problem solving, and decision making; digital citizenship; and technology operations and concepts. Students in this course will develop skills as defined by all six strands.

**Note:** 91817 Web Communications (DC) is for P-TECH Program at Sachse HS only.