

# GSMST Choice Book 2019-2020



## What courses are right for me?

Students,

It's time to think about your courses for next year. As you consider which courses you wish to take, keep in mind that GSMST does yearlong registration. Whatever you elect to take this spring will be your classes for the entire next school year. Therefore, you need to make sure you CAREFULLY consider your choices. We hire teachers in the spring of the year based upon your course selections. We are unable to make schedule changes after June. "Changing your mind" about taking a course is not a valid reason for a schedule change so please choose wisely, plan ahead, and look at the big picture (work ethic, extracurricular activities, course expectations, summer assignments, overall workload considerations, possible impact on GPA, etc.)

**Because courses are yearlong in nature**, when you are through with the registration, you should have a total of 14 courses for the year. 7 courses for first semester and 7 courses for second semester. Many of the electives require pre-requisite course work, so make sure you check carefully with the teacher who registers you to make sure you can get into the course of your choice.

If you are unclear about certain electives, you may ask the following teachers in these areas:

Band	<a href="mailto:Matt_Haynor@gwinnett.k12.ga.us">Matt_Haynor@gwinnett.k12.ga.us</a>	Room: 5.111
Engineering	<a href="mailto:Jason_Boyette@gwinnett.k12.ga.us">Jason_Boyette@gwinnett.k12.ga.us</a>	Room: 5.146
Journalism	<a href="mailto:Gabe_Andrews@gwinnett.k12.ga.us">Gabe_Andrews@gwinnett.k12.ga.us</a>	Room: 2.107
Language Arts	<a href="mailto:Renee_Covin@gwinnett.k12.ga.us">Renee_Covin@gwinnett.k12.ga.us</a>	Room: 2.178
Mathematics	<a href="mailto:Christy_Mullen@gwinnett.k12.ga.us">Christy_Mullen@gwinnett.k12.ga.us</a>	Room: 5.347
Orchestra	<a href="mailto:David_Richardson@gwinnett.k12.ga.us">David_Richardson@gwinnett.k12.ga.us</a>	Room: 5.123
Science	<a href="mailto:Jana_Czerwonkey@gwinnett.k12.ga.us">Jana_Czerwonkey@gwinnett.k12.ga.us</a>	Room: 5.008
Social Studies	<a href="mailto:Elfi_Funk@gwinnett.k12.ga.us">Elfi_Funk@gwinnett.k12.ga.us</a>	Room: 2.101
Visual Arts	<a href="mailto:Lauren_Phillips@gwinnett.k12.ga.us">Lauren_Phillips@gwinnett.k12.ga.us</a>	Room: 2.136
World Languages	<a href="mailto:Luke_Rapley@gwinnett.k12.ga.us">Luke_Rapley@gwinnett.k12.ga.us</a>	Room: 5.223
Year Book	<a href="mailto:Adam_Brown@gwinnett.k12.ga.us">Adam_Brown@gwinnett.k12.ga.us</a>	Room: 2.109

I hope you have a productive and smooth registration process.

Sincerely,

Luke Rapley,  
Assistant Principal, Curriculum

For detailed descriptions of the Advance Placement Courses offered at GSMST, please see the AP Booklet Online at [www.gsmst.org/gsmst\\_web/](http://www.gsmst.org/gsmst_web/)

(Last updated on 2/22/19)

## Special Points of Interest

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Engineering	3	Jason Boyette	5.146
Fine Arts	6	Laurie Duke	5.116
Health and Physical Education	11	Beth Presten	2.121
Language Arts	12	Renee Covin	2.178
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Science	16	Jana Czerwonky	5.008
Social Studies	18	Elfi Funk	2.101
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# ENGINEERING

## The three classes in the required Engineering Pathway

### 1. Foundation of Engineering and Technology: 9

This course is taught in a project-based environment along with the Physics content. Students learn about the different fields of engineering and explore career options, learn and apply the engineering design process, apply the principles of science, technology, engineering and mathematics. They learn to work in teams as they build projects that support both the engineering curriculum and the physics concepts.

### 2. Concepts of Engineering: 9

This course is taught in a project-based environment with the Physics content. It is the second semester course of engineering with the Physics/Engineering PBL. Students become more independent with their design team for the projects as they continue to apply the engineering design process to their work. They learn Microsoft Excel and use it as a tool to store data and chart project data collection.

### 3. Engineering Applications: 10

Students will apply knowledge of the engineering design process to solve engineering/ technological problems while demonstrating planning and time management skills and tools to enhance results. Develop and apply detailed plans to solutions for design problems using mathematical and scientific concepts. Students will work collaboratively to develop appropriate models, design and construct a testable prototype, and present their projects using oral, written, and visual communication skills to obtain, interpret, and present information to and from intended audiences.

### \*Appropriate and Alternative Energy: 11 – 12

Students will investigate nonrenewable, renewable, and inexhaustible energy sources, as well as their environmental and societal impact. The students will develop prototypes that utilize various energy sources, and they will test and evaluate their devices. Additionally, the students will perform a number of laboratory experiments to further investigate several of the energy sources, including fuel cells, biofuels, and solar cells.

### \*Biochemical Engineering: 11 – 12

The highlights of this course investigate the quantitative aspects of membrane transport and cell signaling pathways. We will look at how the cell signaling modifies gene expression and/or cell function, regulation of cell growth and cell death, regulatory mechanisms of gene expression and protein synthesis, biotechnology processes including PCR, RNA silencing and bio-imaging, molecular and imaging technologies used in biomedical research and the development and delivery of biotechnology to the marketplace.

### Computer Science Principles: 9 – 12

Students will develop the computer science skills of algorithm development, problem solving, and programming. While the emphasis of the course will be programming, a major objective is to foster a fundamental understanding of the operation of computers and computer networks. To that end, topics, such as careers, the limits of computing, ethical issues and the difference between interpreters and compilers will also be introduced. Additionally, a working understanding of the internet, common formats for data transmission, and some insights into the design of the human-computer interface will also be developed through web page creation.

### AP Computer Science (Java): 10 – 12 \*Pre-requisite: Computer Science Principles or Teacher Approval

Through the intense study of structured programming in Java, students will become proficient in programming methodology, algorithms, and data structures. It also includes the study of data structures, design, and abstraction. Objectives for this course follow the College Board syllabus, preparing students for the optional AP exam.

## **ENGINEERING** *(continued)*

**Information Technology Essentials (ITE): 10 – 12** ITE focuses on Personal Computer Hardware and Software. The course provides an introduction to the computer hardware and software skills needed to help meet the growing demand for entry-level information and communication technology (ICT) professionals. The course covers the fundamentals of PC technology, networking and security, and also provides an introduction to advanced concepts. Students who complete this course will be able to describe the internal components of a computer, assemble a computer system, install an operating system, and troubleshoot using system tools and diagnostic software. The course is a hands-on, career-oriented e-learning solution with an emphasis on practical experience to help students develop fundamental computer skills, along with essential career skills.

### **\*Nanotechnology and Materials Engineering: 11 – 12**

In this course, students will be introduced to nanotechnology and materials science. This will include the fabrication and analysis of nanoscale systems, as well as their applications to the real world. Students will conduct numerous experiments exploring various aspects of nanotechnology. As part of the experiments, the students will learn how to use various research techniques, utilize various tools used in nanotechnology research and prototype development of devices utilizing nanotechnology.

### **\*Robotics and Mechatronics: 9 – 12**

This inquiry based project course consists of students working independently and collaboratively in research, design, and development of robotics and automation systems. There will be an emphasis on the application and integration of science, engineering, and technological principles in this course. Students will be introduced to the principles of robotics and mechatronics including the role of automated systems in industry and business. They will develop an array of automated mechanisms whose function relies on the integration of mechanical and electronic components coordinated by software architecture.

### **Advanced Robotics: 10 – 12**

The second class in the robotics series adds new programming languages and larger more exciting robots, parts and sensors. Students will work on independent and group custom robotic challenges. The class includes the use of various metal, plastic, and wood working power tools. Instruction includes computer aided machining and manufacture. The class can provide a basis for students entering nationally recognized high-stakes robotics and automated vehicle competitions including FIRST FTC robotics, FIRST FRC robotics, BEST Robotics, VEX robotics, ROV (underwater robotics), aeronautical, watercraft, humanoid, and rescue robots.

### **Introduction to Animation and 3D Design: 9 – 12**

Introduction to Animation and 3d Design is a foundations course that serves as an introduction to the animation and 3d design industry. The course emphasis is placed on career awareness, fundamentals of modeling, storyboard creation, cameras and lighting. Students will learn how 3d technology is used for film, broadcast and games and how it is rapidly becoming the medium of choice for industrial design, military simulations, and medical visualization. The standards are aligned with the interactive media standards in Georgia's technical colleges, thus helping to qualify students for advanced placement should they continue their education at the postsecondary level.

### **Principles and Concepts of Animation: 10 – 12**

This course will take students deeper into engineering and design, using software and equipment to conceptualize, create, analyze, and market effective solutions to design problems. Students will use numerous software packages throughout the course and will also create physical models and working prototypes. Students will create realistic animations and virtual scenes to be used as communication and marketing tools. The manufacturing process, including materials selection, will be explored in order to create the most appropriate solutions to the given design problems. Programs used will include 3DS Max, Inventor, Photoshop, Illustrator, as well as many others.

## **ENGINEERING** *(continued)*

### **Advanced Animation and Game & App Design: 11 – 12**

Students will build on the concepts from the introductory course. The course will focus on individual long term projects that allow the students to focus on specific areas of interest related to 3D Modeling and Analysis. Topic areas will include game design, product design, animation, software physics, scene creation, software analysis, character modeling, video production, as well as many others.

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**\*Counts as a Fourth Science Course**

# FINE ARTS

## Art

### **Draw Paint I: 9 – 12**

This course encompasses exploration of image and makes use of techniques in drawing, painting and collage. Students will learn skills in a variety of drawing and painting techniques, including the use of contour line, gesture line, value and color. We will embrace unique and creative thinking and foster the development of creative, self-disciplined, and motivated individuals. Students are expected to communicate at a basic level about visual arts' materials, tools, and techniques while defining and solving artistic problems. They will be able to develop basic analyses of works of art from structural, historical and cultural perspectives. Historical and contemporary achievements in two-dimensional art are explored.

### **Draw Paint II: 10 – 12 \*Prerequisite: Successful Completion of Draw Paint I**

Students will build on the skills developed in Drawing and Painting I. The development of a personal drawing and painting style will be introduced with an emphasis on constructing individual visual statements that communicate feeling and ideas. Career opportunities in the field will be examined. Related historical and contemporary art works will be explored.

### **Photo I: 9 -12**

Students will be introduced to the creation of images using electronic digital still cameras, scanners, video cameras, and digital studio cameras. They will apply knowledge of elements of art and principles of design in creating photographic artworks. The work will be illustrative, documentary, photo journalistic, and experimental in nature. The traditional skills of retouching will be explored in an electronic format, as well as, the changing role of digital photography in the new world of web/internet/intranet publications. Students are introduced to basic lighting and flash photography as well as historical and contemporary developments in photography.

### **Graphic I (Photo IV): 10 – 12 \*Prerequisite: Successful Completion of Photo I**

Students will make independent decisions and evaluate judgments during the creative process and in resolution of specific problems related both to Graphic Design and Digital Photography. The design course consists of hands-on production using a variety of electronic media, software, techniques and equipment to make independent decisions while producing designs to clarify communication and improve learning. This course allows students to explore concepts used in creative software programs (Photoshop, Illustrator, Indesign, etc.) graphics (typography, layout design, packaging design, logos, pictograms, visual identity, posters, advertising, and Web design). Projects and problems will be explored to simulate experiences with the world of work. Career opportunities in photography and graphic design, as well as historical and contemporary developments in design will be explored.

### **Advanced Digital and Media Design: 11 – 12 \*Prerequisite: Successful Completion of Graphic I (Photo IV)**

The fast-paced Advanced Digital and Media Design course offers students the opportunity to develop their own style in a highly creative environment, while exploring photography and graphic design equipment, software, technology, and techniques. Students will make independent decisions and evaluative judgments during the creative process and in the resolution of specific computer art problems. Aesthetic issues will be discussed as they apply to computer art. Contemporary, legal, and historical developments related to the computer arts will be explored. Broad exposure to all types of design will help student begin to build a professional portfolio.

## **FINE ARTS** (Continued)

*Students are recruited into the AP Studio Art Program, usually from the art elective they take in the 9<sup>th</sup> and 10<sup>th</sup> grades. Visually gifted students are encouraged to take AP studio Art in the 11<sup>th</sup> and 12<sup>th</sup> grade, and many students take more than one AP art course before graduating from high school. Students enroll in the program in the spring for the next school year on the basis of teacher recommendation.*

### **AP Studio Art: 2D Portfolio: 11 – 12 – Teacher Recommendation Required**

#### **\*Prerequisite: Successful Completion of Drawing and Painting II or Advanced Digital and Media Design**

The student will follow the prescribed College Board 2-D design portfolio (AP Studio) curriculum. Students may submit work for AP credit. Work concentration will be in, but not limited to, graphic design, typography, digital imaging, photography, collage, fabric design, weaving, illustration printmaking, painting and mixed media as well as abstract, observational, and inventive works.

Student must demonstrate competence and self-motivation in numerous advanced-level Visual Arts Courses and must pass a portfolio check by instructor of the course.

**This course will require a large amount of work to be completed outside of the normal school day, including summer assignments.**

### **AP Studio Art: Drawing Portfolio: 12 Only-Teacher Recommendation Required**

#### **\*Prerequisite: Successful Completion of AP Studio Art: 2D Portfolio**

The student will follow the prescribed College Board drawing portfolio (AP Studio) curriculum. Students may submit work for AP credit. Work concentration will be in, but not limited to painting, printmaking, mixed media as well abstract, observational, and inventive works, (works of photography, videotapes, and digital works may not be submitted of AP studio Drawing Portfolio.)

Student must demonstrate competence and self-motivation in numerous advanced-level Visual Arts courses and must pass a portfolio check by the instructor of the course.

**This course will require a large amount of work to be completed outside of the normal school day, including summer assignments.**

### **AP Art History: 11 -12 \* Prerequisite: Successful Completion of AP World History Teacher Recommendation Required**

The student will follow the prescribed College Board Art History curriculum. The AP Art History course explores such topics as the nature of art, its uses, its meanings, art making, and responses to art. Through investigation of diverse artistic traditions of cultures from prehistory to the present, the course fosters in-depth and holistic understanding of the history of art from a global perspective. Students learn and apply skills of visual, contextual, and comparative analysis to engage with a variety of art forms constructing understanding of individual works and interconnections of art-making processes and products through history.

**This course will require a large amount of work to be completed outside of the normal school day, including summer assignments.**

## **FINE ARTS** (Continued)

### **BAND**

- **Students are expected to participate in all concerts and extra rehearsals**

#### **Intermediate Band: 9 – 12**

9th Grade Students are generally placed into the Intermediate Band based on middle school band directors' recommendations. Advanced rising 9th grade students who wish to be considered for placement in the Advanced or Mastery Band will be required to schedule an audition with the high school directors.

#### **Mastery Band: 9 – 12 \*Audition required**

The band program at GSMST offers students a variety of opportunities to learn and perform music. In addition to symphonic band, students can participate in chamber ensemble and jazz band. Currently, chamber groups at GSMST include; percussion ensemble, brass quintet, woodwind quintet, jazz band and jazz combo. In addition to the opportunity to be expressive through music, the symphonic band, chamber groups and jazz bands perform frequently in a variety of settings.

### **CHORUS**

- **Students are expected to participate in all concerts and extra rehearsals**

#### **Beginning Chorus: 9 – 12**

Students continue to acquire vocal skills in music reading, performance techniques and composition of choral music. A variety of literature from various historical periods is performed with emphasis placed on standard choral repertoire, independence and confidence in performance situations, and understanding of the theoretical and historical basis for the music performed.

#### **Intermediate Chorus: 9 – 12 \*Prerequisite**

Students continue refining performance techniques and composition of Choral music.

#### **Advanced Chorus: \*Prerequisite – previous voice Choral experience and/or audition.**

Advanced vocabulary and skills are necessary. (After school performances/uniform required). Teacher recommendation or audition only

### **GUITAR**

#### **Beginning Guitar: (two semesters) 9 – 12**

Students acquire basic music reading and guitar playing techniques including, tuning chords, rhythm and strumming/picking techniques. Students will learn variety of music and gain understanding of the theoretical and historical basis for the music performed.

#### **Intermediate Guitar: (two semesters) 9 – 12**

Students acquire basic music reading and guitar playing techniques including, tuning chords, rhythm and strumming/picking techniques. Students will learn variety of music and gain understanding of the theoretical and historical basis for the music performed.

#### **Advanced Guitar: (two semesters) 9 – 12**

Students acquire basic music reading and guitar playing techniques including, tuning chords, rhythm and strumming/picking techniques. Students will learn variety of music and gain understanding of the theoretical and historical basis for the music performed.



## **FINE ARTS** (Continued)

### **MUSIC TECHNOLOGY**

#### **Beginning Keyboarding Techniques**

Students continue to acquire skills in music reading and piano performance techniques. A variety of literature is performed with emphasis placed on individualized instruction, specifically an understanding of the theoretical and historical basis for the music performed. Students explore the composition and improvisation of instrumental music.

**Required out-of-class activities, as stipulated by the teacher, will determine a portion of the student's grade.**

#### **Beginning Music Techniques: 9-12 \*\*prerequisite: Requires concurrent enrollment in Band or Orchestra, or Beginning Keyboarding Techniques.**

Students will gain a basic proficiency and knowledge of music sequencing, digital synthesis, music notation and sampling as well as basic audio recording through interactive engagement with computer hardware, software and peripherals.

#### **Intermediate Music Technology: 9 – 12 \*\*prerequisite: Requires concurrent enrollment in Band or Orchestra, Beginning Keyboarding Techniques. \*Prerequisite or prior piano experience with teacher approval**

Students will continue to develop an appreciation of the fusion between music and technology in its cultural contexts through selected readings listening and hands on assignments: Creativity and high production standards are encouraged. The music technology class produces two CD's per year; highlighting student accomplishments.

#### **Advanced Music Technology: 9 – 12 \*\*Prerequisite: Introduction/Intermediate Music Technology**

Students will continue to delve into creating music soundtracks to movies, TV commercials and computer games through the use of computers, synthesizers and studio engineering. Further mastery of compositional techniques, harmonization, orchestration and arranging will be explored in depth. Students will leave this class with the fundamentals to pursue music production in the music industry.

### **ORCHESTRA**

- **Students are expected to participate in all concerts and extra rehearsals**

**\*\*An interview/audition is required for placement in advanced level orchestras\*\***

#### **Intermediate Instrumental Ensemble: 9 – 12**

Students continue to master three-octave scales and will continue to advance their technique in bowing, higher positions, tone, rhythm, and intonation in preparation for the next level orchestra. Emphasis is on building musicianship skills to perform level III/IV music.

#### **Intermediate Orchestra: 9 – 12**

Students should have mastered two-octave scales and will begin on three-octave scales and advanced technique of tone, rhythm, intonation and upper positions in preparation for the next level orchestra. Emphasis is on building technical skills to perform music at level IV.

#### **Advanced Orchestra: 9 – 12**

Students should have mastered three-octave scales and will continue to advance their technique in bowing, higher positions, tone rhythm, and intonation in preparation for the next level orchestra. Emphasis is on building musicianship skills to perform level IV/V music.

## **FINE ARTS** (Continued)

### **Mastery Orchestra: 9 – 12 \*Audition required**

This advanced class focuses on techniques of bowing, higher positions, rhythm, and intonation in preparation for the next level orchestra. Emphasis is on building musicianship skills to perform at level V/VI.

### **AP Music Theory: 11-12**

AP Music Theory introduces and develops students in musicianship, theory, musical materials, and procedures. It has a strong focus on harmony; however, it integrates aspects of melody, harmony, texture, rhythm, form, musical analysis, elementary composition, and, to some extent, history and style. Musicianship skills such as dictation, sight-singing, and keyboard harmony are also an important part of the theory course. The student's ability to read and write musical notation is fundamental to such a course. Students may take the AP Music Theory Exam in May in efforts of earning a score of 3 – 5, which will yield credit towards music theory college courses.

## HEALTH AND PHYSICAL EDUCATION

### **Personal Fitness: 9 – 12**

This course is a graduation requirement and a prerequisite to all elective physical education courses. The course provides the students with a sound, basic knowledge and understanding of how to obtain a healthy level of physical fitness. It is recommended that this course be taken in the 9th grade.

### **Health: 9 – 12**

This course is a *graduation requirement* designed to offer a practical approach to health topics that concern adolescents. The course covers knowledge and skills necessary for personal health and well-being and the prevention and treatment of injury. Additional information covered includes: disease prevention, relationships, consumer health, the life cycle, and preventing abuse of tobacco, alcohol and drugs.

### **General PE 1: 9-12**

This course provides students with an opportunity to learn the history, rules, and basic skills of the following team sports: basketball, volleyball, soccer, and flag football. As the courses progress, students will have an opportunity to experience team play, strategy development, and officiating techniques in each of the team sports offered.

# LANGUAGE ARTS

## **Freshmen Language Arts**

Freshman Language Arts prepares students for upper-level high school reading and writing. Students study nonfiction and fiction, as well as a small amount of poetry, and the course focuses on analysis and critical thinking. Students take part in class discussions utilizing multiple methods such as Socratic seminar and online posts to improve critical thinking skills. Students continuously work through steps of the writing process to develop writing skills while simultaneously developing vocabulary, speaking, listening, researching, and test-taking skills, and read engaging texts that blend the sciences and the humanities for an authentic approach to both reading and writing. The 9<sup>th</sup> grade year ends with the Georgia Milestones Test.

## **Sophomore Language Arts – World Literature**

Sophomore Language Arts includes a balance of rhetoric and composition, applied grammar, literature, and nonfiction. World literature provides most of our texts; however, the class analyzes a wide range of supplemental texts from various genres and times periods. Students study Latin-based vocabulary and develop their skills of deciphering vocabulary in context. Class discussion, Socratic seminar, and presentations offer opportunities for students to demonstrate speaking and listening proficiency. A comprehensive research project takes students through the process of crafting and annotated bibliography and a formatted research paper. Teachers guide students through the language arts learning standards to enhance performance on the Gateway exam and prepare for language arts AP courses senior year.

## **Junior Language Arts – American Literature**

American literature aligns with United States history and government through the American studies approach. American studies survey the great works in American letters chronologically including the reading and analysis of primary source documents to enhance the historical inquiry. Students read a wide assortment of fiction and non-fiction. The course includes a focus on grammatical and rhetorical devices used in writing and speaking, and provides opportunities for students to revise their writing to achieve greater clarity and grammatical control. Students study Latin-based vocabulary and hone their skills of decoding new words through vocabulary in context. Class discussion, student presentations, and Socratic seminar promote students' listening and speaking skills. Students will participate in a variety of research assignments that closely intersect with the historical era under consideration. The junior year culminates with the Georgia Milestones Examination.

## **Senior Language Arts (Students will choose ONE of the following AP courses)**

**AP English Language and Composition** prepares students for college-level reading and writing with a focus on preparation for the AP exam as well as collegiate work. Students study primarily non-fiction as well as other types of prose, and the course focuses on analysis and critical thinking. Students will practice and revise to improve writing and engage in class discussion to improve critical thinking skills. Students will read engaging texts combining the study of scientific and practical knowledge with a focus on communication that blends the sciences and the humanities for a realistic approach to both reading and writing.

**AP English Literature and Composition** is a college level course for high school students interested in improving themselves as critical readers, thinkers, and writers. The course introduces enthusiastic students to college-level prose and poetry, and in the case of students already possessing some experience in literature, fosters the skills of a mature reader and writer. In the AP English Literature course, students are involved in both the reading of and writing about contemporary and classic fiction and drama. The course includes preparation for the AP exam as well as collegiate work.

## Language Arts (continued)

### **Journalism/Literary Magazine: 10 – 12**

This course provides students who are interested in journalism with an opportunity to explore and to experience the process involved in the creation of a large publication, including preplanning, designing layouts, copyrighting, proofreading, organizing visuals, and managing finances, all of which involve creativity. Students will publish the GSMST literary magazine, *IFINITAS*

### **Journalism/Yearbook: 9 – 12**

This course provides students who are interested in journalism with an opportunity to explore and to experience the process involved in the creation of a large publication, including preplanning, designing layouts, copyrighting, proofreading, organizing visuals, and managing finances, all of which involve creativity. Students will publish and sell the GSMST yearbook, *VANGAURD*.

# MATHEMATICS

## **Accelerated Algebra I: 9**

This fast-paced course is designed to prepare students to take AB or BC Advanced Placement Calculus. The course incorporates 1 1/2 years of the content of the standard math sequence. It includes relationships between quantities, equations and inequalities, linear and exponential relationships, describing data, transformations, coordinate geometry, similarity, congruence, proofs, right triangle trigonometry, and introduction to analytic geometry.

## **Accelerated Geometry: \*\*Prerequisite Accelerated Algebra**

This is the second in a sequence of mathematics courses designed to prepare students to take AP Calculus AB or BC in their high school program. The course incorporates 1 1/2 years of content in the standard math sequence. It includes number systems, quadratic functions, geometry, probability data inferences and conclusions, polynomial functions, rational & radical relationships, exponentials & logarithms, and trigonometric functions & mathematical modeling.

## **Accelerated Pre-Calculus: \*\*Prerequisite Accelerated Geometry**

This is the third in a sequence designed to prepare students to take AP Calculus AB or BC. It includes circles, parabolas, ellipses, hyperbolas, trigonometric & inverse functions, trigonometric identities, matrices, vectors, and probability.

## **AP Calculus AB: \*\*Prerequisite Accelerated Pre-Calculus**

The objectives follow the AP syllabus developed by the College Board for the Advanced Placement (AP) Calculus Examination. This college level course provides an in-depth examination of limits, derivatives and integrals of algebraic and transcendental functions; continuity; applications of derivatives to related rates; maxima and minima; curve sketching; integration formulas; applications of the definite integral; and methods of integration.

## **AP Calculus BC: \*\*Prerequisite Accelerated Pre-Calculus AND Teacher Recommendation**

The objectives follow the AP syllabus developed by the College Board for the Advanced Placement (AP) Calculus BC Examination. This college level course provides an in-depth examination of limits, derivatives, and integrals of algebraic and transcendental functions; continuity; applications of derivatives to related rates; maxima and minima; curve sketching; integration formulas; applications of the definite integral; methods of integration, graphing, and integrating in polar coordinates; infinite sequences and series; power series, vectors; and differential equations.

## **Advanced Calculus II**

This course is the study of integral evaluation, limits of sequences, application of function concepts, and application of polar coordinates, L'Hospital's Rule, Pappus's Theorem on surface area, differentiation & integration of power series, three dimensional coordinate geometry, vectors, and vector calculus. This course is taken after AP Calculus AB.

## **AP Statistics**

This college level course provides an in-depth experience in statistical concepts and methods, including data collection and exploration, experimental and theoretical probability, probability distributions, and descriptive and inferential statistics. Projects involve planning a study, anticipating patterns, producing models, and confirming models. The objectives for this course follow the College Board syllabus, preparing students for the optional Advanced Placement exam. This is an elective math course for students and not in the required curriculum.

## **Differential Equations**

This course consists of two interrelated parts: Linear Algebra & Differential Equations. In this course students will develop an understanding of the basic theory, applications and connections of linear algebra and differential equations. This course provides a central foundation upon which many areas of both pure and applied mathematics are built. We will use the software system Wolfram Mathematica 9 to explore and investigate concepts and mathematical modeling applications. A basic understanding of ordinary differential equations and their solutions is particularly useful for students planning to study physics, chemistry, economics, engineering, biology and many other of the sciences. Prerequisites include at least two years of Calculus (including AP Calculus AB/BC and either Georgia Tech's Calculus II/III, Multivariable Calculus or Calculus II).

## **MATHEMATICS** *(continued)*

### **Multivariable Calculus**

This course is the study of three-dimensional coordinate geometry, matrices & determinants, eigenvalues & eigenvectors of matrices, limits & continuity of functions with two dependent variables, partial differentiation, multiple integration, the gradient, the divergence, the curl, Theorems of Green, Stokes and Gauss, line integrals, integrals independent of path and linear first-order differential equations. This course is taken after AP Calculus BC.

### **Number Theory**

This is a senior level writing enhanced (i.e. proof-based) course in advanced mathematics. During first semester, the course will focus on proof-writing, notation, and introduction to basic logic, set theory, divisibility, and relations. The main goal of this course is to develop a strong foundation for rigorous mathematics. Students will be expected to learn how to understand and write rigorous mathematical proofs. This will be motivated through a study of the integers and algebra. During the second semester, the course will provide an introduction to elementary number theory. Topics covered will include, but not be limited to distribution of primes, representation of integers, Fibonacci numbers, Euclidean Algorithm, Fermat Numbers, Fundamental Theorem of Arithmetic, Diophantine Equations, Congruence's, Modular Arithmetic, Chinese Remainder Theorem, Fermat's Little Theorem, and an overview of current open problems in Number Theory. We will use the typesetting software LaTeX to create mathematics documents, homework, etc. This course provides an overview of theoretical mathematics and would be ideal for students who wish to continue their education in mathematics.

## SCIENCE

### **Analytical Forensic Investigation: 11 – 12**

Course designed to extend student theoretical knowledge and practical applications of physics, chemistry, and biology within multiple forensic science disciplines. Students will develop understanding of key concepts that are specific to the forensic context while learning and applying techniques that are used in forensic science as well as many other science disciplines. Lessons and activities will further develop student's critical thinking skills, application of various research techniques, and communications of results as we explore degrees of evidentiary associations and their relationship to environment, circumstances, or judicial proceedings. The course extends key principles in the areas of optics, organic and analytical chemistry, biology, and biotechnology within authentic, laboratory applications. The course provides significant opportunities for students to apply skills that characterize scientific methods and processes as well as to extend their content area knowledge beyond the high school curriculum.

### **AP Biology: 10 \*Prerequisite: successful completion Chemistry**

This yearlong course is designed to be the equivalent of a college introductory biology course usually taken by biology majors during their first or second year. Major topics covered in this class include molecules and cells, heredity and evolution, and organisms and populations. This is a required course for GSMST. **Students in this class will also have to complete summer assignments as part of their course grade.** This is an extremely rigorous class. Students in this class should expect to study an hour or more daily.

### **AP Chemistry: 11 – 12 \*Prerequisite AP Calculus**

The AP Chemistry course taught in high school is designed to be the equivalent of a general chemistry college course that students take during the first college year. In May, a student completing the course is expected to take a standardized exam to determine eligibility for advanced placement and/or credit for college chemistry lecture and/or lab courses depending upon a student's achievement, laboratory documentation, and college selection.

### **AP Environmental Science: 11 – 12**

The goal of the AP Environmental Science course is to provide students with the scientific principles, concepts, and methodologies required to understand the interrelationships of the natural world; to identify and analyze natural and manmade environmental problems; to evaluate the relative risks associated with these problems; and to examine alternate solutions for solving and/or preventing them (College Board, Advanced Placement Program).

### **AP Physics C – Mechanics: 11 – 12 \*Prerequisite AP Calculus and successful completion of first year physics**

This course ordinarily forms the first part of the college sequence that serves as the foundation in physics for students majoring in the physical sciences or engineering. The sequence is parallel to or preceded by a mathematics course that includes calculus. The focus of the course is mechanical systems. The course meets for one period per day and includes lab.

### **AP Physics C – Mechanics and Electricity & Magnetism: 11 – 12 \*Prerequisite AP Calculus and Co-requisite enrollment in Multi variable Calculus or Georgia Tech Calculus II/III**

This course ordinarily forms the first part of the college sequence that serves as the foundation in physics for students majoring in the physical sciences or engineering. The sequence preceded by a mathematics course that includes calculus. Methods of calculus are used wherever appropriate in formulating physical principles and in applying them to physical problems. In addition to mechanical systems, students study electricity and magnetism. The course meets for two periods per day and includes lab.



## **SCIENCE** *(continued)*

### **Chemistry Honors/Gifted: 9**

This accelerated course is designed for gifted/honors students who excel in science and math to help them learn the major theories and principles of the living world while preparing them for the opportunity to take Advance Placement science classes in the following years. Laboratory experience to develop problem solving abilities is emphasized. This class requires students to study daily in order to achieve the academic success they desire. This is a prerequisite course for AP Biology.

### **Chemistry II: Introduction to Organic Chemistry overview in one semester**

This class introduces students to key ideas in organic chemistry – naming compounds, molecular structure and functional groups, and common reactions that convert one chemical into another. Course work includes regular laboratory work along with content lectures and readings combined with student projects. The course emphasizes the role of organic chemicals in the modern world with a strong emphasis on biological applications of organic molecules. As an introductory course, it can bridge the GSMST 9<sup>th</sup> grade chemistry experience to what might be involved in college, and given its content area, it can help more advanced students prepare for more formal college organic courses.

### **Microbiology: 11-12**

Study of microscopic organisms & their impact on their environment; Topics: growth & identification of bacteria, microbes, viruses, pathogenic microbiology.

### **Physics/Engineering Project-Based Class: 9**

Project areas of study include kinematics, circular motion, torque, circuits, sound, and optics. Emphasis is placed upon teamwork, as students follow engineering roles, working together to develop research proposals and project centered on the Physics academic knowledge and skills. Each project is grounded on real-world applications and solutions to problems. Students will build structures, collect data, and test the strength/effectiveness/viability of their designs. Each step of the engineering process: research, experimentation, development, building, testing, and evaluating the success of the project are documented on the teams' websites. *\*\*Foundations of Engineering and Engineering Concepts*

### **Science Seminar: 11 – 12**

Is designed to extend students' critical thinking and scientific reasoning skills, improve their evaluation and understanding of different scientific communication genre, increase proficiency in personal scientific communication and technical rhetoric, improve students' understanding of their roles in the scientific community and scientific enterprise, and develop a holistic perspective of the public's perception of science.

## **SOCIAL STUDIES**

### **Sophomore Year (choose one)**

#### **Advanced Placement World History – two semesters**

This course explores the expansive history of the human world. Pointed focus is placed on developing critical thinking skills as well as the analysis of primary and secondary historical sources. Five essential themes frame this course: Interaction between humans and the environment; development and interaction of cultures; state-building, expansion and conflict; creation, expansion, and interaction of economic systems; and development and transformation of social structures.

Specific skills essential to success in this course include the examination of historical changes over time; the interconnectedness of events over time; and the geographic, political, and social evolution of various cultures and societies. The course culminates with the Gwinnett County Gateway examination as well as the College Board AP World History.

#### **Gifted/Honors World History – two semesters**

The World History course explores the key events and global historical developments from prehistory until the present day. The scope of the World History course ranges widely across all aspects of human experiences: economics, science, religion, philosophy, politics, laws, military conflict, literature, and the arts. The course will illuminate connections between our lives and those of our ancestors around the world. Students will uncover patterns of behavior, identify historical trends and themes, explore historical movement and concepts, and test theories. Students will refine their ability to read for comprehension and critical analysis; summarize, categorize, compare, and evaluate information; write clearly and convincingly; express facts and opinions orally; and use technology appropriately to present information. The course culminates with the Gwinnett county Gateway examination.

### **Junior Year (choose one)**

#### **Advanced Placement United States History/Advanced Placement United States Government – two semesters**

Advanced Placement United States history and Advanced Placement United States Government are seamlessly integrated with the English course American literature to comprise the advanced level eleventh grade American studies humanities course. Both components of the American studies course engage the content chronologically. Complementary and integrated content and assignments allow for a unified, cohesive approach to this course-of-study. The course culminates with the Georgia state examination and two College Board examinations necessitating a rigorous approach in order to facilitate high levels of student achievement. Respondents to the annual GSMST alumni survey report that the integrated history/English approach serves as excellent preparation for success in competitive and highly competitive colleges.

#### **Honors/Gifted US History and United States Government – two semesters**

Honors/Gifted United States History and United States Government is a combined course for eleventh grade students. This class is integrated with the eleventh grade English course, American literature, to create an America studies humanities approach. Combining the courses helps students to gain a deep understanding of the political, economic, and social history of the United States. This comprehensive course is very challenging, but will help students gain a fundamental understanding of the country in which they live. The course culminates with the Georgia State examination in United States History.

## **SOCIAL STUDIES** *(continued)*

### **Senior Year** *(both courses are mandatory)*

#### **AP Macroeconomics – one semester**

Advanced Placement Macroeconomics provides students a detailed understanding of the principles of economics that apply to the modified market economy of the United States. The course addresses fundamental concepts of economics and places particular emphasis on macroeconomic measures of the economy as well as the study of national income, price level determination, and economic growth. In addition, students develop a fundamental understanding of the global economy and its impact on a national economy. This course satisfies the Georgia state requirements for economics and serves as the preparatory course for the End Of Course assessment.

#### **AP Microeconomics – one semester**

AP Microeconomics provides students a detailed understanding of microeconomics principles. Functions of individual decision makers, both consumers and producers, within a larger economic system are addressed by engaging in real world application of economic concepts. The course emphasizes the nature and functions of the product market with special focus on the interactions of consumers and producers. The four major types of market structures are also closely examined. In addition, the role that government plays in promoting greater efficiency and equity in the economy are also addressed in the course.

### **Electives**

#### **Controversial Issues – one semester** *(open to 11 and 12 grade)*

This elective half-year course engages some of the most divisive issues of our time. The course approaches these issues on a class-wide basis as well as through project-based learning. This course seeks to encompass a wide range of content areas through the examination of various controversial issues.

#### **Advanced Placement Human Geography – two semesters** *(open to all grades)*

This year-long elective course introduces students to the systematic study of patterns and processes that have helped shaped human understanding, use, and alteration of Earth's surface. Students employ spatial concepts and landscape analysis to examine human social organization and its environmental consequences. Students also engage the methods and tools geographers use in their science and practice,

#### **Advanced Placement Comparative Government – one semester** *(open to 11 and 12 grades)*

This elective course examines a wide variety of political and economic systems such as authoritarianism, communism, democratic socialism, and democracy in its many forms. The United States system of governance is not emphasized in this course as the AP Unites States Government course focuses entirely on the United States system. This course is especially suitable for GSMST juniors and seniors as it complements the global approach that is the foundation of our tenth grade world history offerings, our foreign language program, and the telepresence experience. Moreover, this course is a half-year course and thus works well as a semester counterpart to the JFE program and for seniors seeking an advanced half-year elective.

## **SOCIAL STUDIES** *(continued)*

### **Advanced Placement Psychology – two semesters** *(open to 11 and 12 grades)*

The AP Psychology course is designed to introduce students to the systematic and scientific study of the behavior and mental processes of human beings and other animals. Students are exposed to the principles and phenomena associated with major subfields within psychology. Students also learn about the ethics and methods psychologists use in their science and practice. This course is particularly suited to GSMST students as the course is equal parts science and social studies.

### **Advanced Placement European History – two semesters** *(open to 10 and 12 grades)*

This advanced survey course encompasses the years 1450 to the present. In specific, the course deeply examines the political, diplomatic, intellectual, cultural, and economic evolution of European history. The pedagogical approach emphasizes critical thinking skills and historical changes over time, as well as analysis and synthesis. Intensive reading and writing assignments support the pedagogical approach employed.

## WORLD LANGUAGES

Students are required to take 2 years of the same foreign language to graduate, but many competitive universities recommend 3 to 4 years of foreign language study for admission. Students should refer to the foreign language requirements for their perspective university.

### **Chinese I, Chinese II, Chinese III: 9 – 11**

Through realistic use of the language, the student will learn to communicate in oral and written form on a variety of everyday topics and will gain cultural knowledge of Chinese-speaking countries. Students will participate in engaging authentic activities that strengthen their proficiency in reading, writing, and speaking in the target language.

### **Chinese IV: 11 – 12**

This intermediate level Chinese course is a continuation of Chinese III. The goal of the course is to advance the students' communicative competence in all four aspects of language learning: listening, speaking, reading, and writing. It will be an all Chinese class. To move students closer to being able to read authentic texts, authentic passages on topics related to the lesson text and current issues will be provided in addition to the text book topics.

### **German I, German II, German III: 9 – 11**

German at GSMST offers students the opportunity to learn the language and culture of one of the United States' most important political and economic allies. German is the most commonly spoken language in Europe (over 124 million speakers) and is a national language in six countries. German is the second most important language (behind English) in the fields of business, medicine, and science. The German Club at GSMST also has a chapter of the national German Honor Society, Delta Epsilon Phi. Many of the students at GSMST attend the State German Convention every February and other competitions throughout the year are available to students who wish to compete in German.

### **German IV: 11 – 12**

The student will refine his/her communicative ability and build his/her vocabulary, allowing the student to converse in a variety of situations as well as comprehend authentic literary and factual texts. Cultural understanding remains an important goal throughout the entire sequence of German language study.

### **Spanish I, Spanish II, Spanish III: 9 – 11**

Through realistic use of the language, the student will learn to communicate in oral and written form on a variety of everyday topics and will gain cultural knowledge of Spanish-speaking countries. Students will participate in engaging authentic activities that strengthen their proficiency in reading, writing, and speaking in the target language.

### **Spanish IV: 11 – 12**

Spanish IV consists of a review and a continuation of the content students have learned throughout their Spanish studies, as they go on to master more advanced language skills. The students will be involved in activities that require the communicative use of all four language skills (listening, speaking, reading, and writing). At this higher level of learning Spanish, the learning experience will be mostly independent and include a wide variety of opportunities for the students to engage in deeper discussions, either in writing or as an oral activity. Furthermore, students will expand their cultural awareness by comparing the culture in the United States and the multi-faceted Hispanic worlds since cultural and linguistic competence are equally important in successful communication.

### **AP Spanish Language and Culture: Advanced Placement Spanish – Yearlong Course 11 – 12**

AP Spanish Language and Culture is for the most dedicated and highest achieving students of Spanish. The objective of this course is to develop a high level of proficiency in the four basic skills of communication in Spanish: listening, speaking, reading and writing. It is assumed that the AP Spanish student has retained vocabulary from previous Spanish courses and has a clear understanding of grammatical and syntactical structures. This course is taught with post-secondary expectations with the main objective of scoring high on the AP Spanish Language exam.

## **PATHWAYS ALL GSMST STUDENTS WILL COMPLETE BASED ON REGULAR CURRICULUM**

### **1. Advanced Mathematics**

2 Foreign Language Credits  
4 Math Credits including one of the following:  
AP Calculus AB or BC, AP Stat

### **2. Advanced Language Arts**

2 Foreign Language Credits  
4 LA Credits including one of the following:  
AP Lang., AP Lit

### **3. Engineering & Technology**

Foundations of Engineering & Tech  
Engineering Concepts  
Engineering Applications

## **OTHER AVAILABLE PATHWAYS**

Advanced Science

Advanced Social Studies

Band—3 years of sequential courses

Journalism—3 years of sequential courses

Music Tech—3 years of sequential courses

Orchestra—3 years of sequential courses

Programming

Visual Arts—3 years of sequential courses

World Languages I

World Languages II