



GSSM VIRTUAL

2020-2021 COURSE CATALOG

Table of Contents

About GSSM	3
About GSSM Virtual Programs	3
Program Details	4
Technology	4
The Facilitator	5
Dual Enrollment Courses	5
Accelerate Curriculum Overview.....	7
TEAM UP Curriculum Overview	8
Accelerate Course Descriptions.....	9
Engineering	9
English	11
Mathematics	12
Science	13
<i>Online Elective (Optional) Courses</i>	14
Computer Science	14
Economics	14
Engineering	15
TEAM UP Course Descriptions.....	17
Computational Science	17
Engineering	17
Mathematics	19
Science	20

About GSSM

The Governor's School for Science and Mathematics was founded in 1988 under the leadership of former Governor Carroll Campbell and Charles W. Coker, then-president of Sonoco Products Company.

The mission of the South Carolina Governor's School for Science & Mathematics (GSSM) is to offer our state's most academically motivated students a unique learning environment that strengthens their ability to think critically, stimulates the joy of learning and fosters the excitement of discovery through hands-on scientific research.

The purpose of GSSM is to positively impact South Carolina's economic development through the cultivation of our current students and alumni, who are our state's future political and business leaders.

GSSM Virtual & Outreach Programs Administration

Dr. Ershela Sims, Interim President & Sr Vice President for Virtual and Outreach

Mr. Randy LaCross, VP for Outreach and Global Initiatives

Mrs. Laura Dostert, Chair of Virtual Education

Ms. Lynn McGee, Director of Accelerate and Synchronous Virtual Courses

Dr. Zaria O'Bryant, Director of TEAM UP

About GSSM Virtual Programs

To reach high school students beyond those in the residential program, the South Carolina Governor's School of Science & Mathematics Accelerate program offers live, virtual engineering education to students throughout the state. Educating talented students since 1988, GSSM offers two options to prepare students for engineering majors in college.

The [Accelerate](#) curriculum provides students with an integrated set of courses that deliver high quality science, engineering and math instruction, along with valuable skills in critical analysis and professional communication taught in a series of English courses. Accelerate provides students opportunities for collaboration, social engagement, as well as research and design that hinge on the program's model of integration of knowledge across multiple disciplines.

Teaching, Engaging, and Advancing Minds for Undergraduate Preparedness ([TEAM UP](#)) introduces students to the disciplines of engineering, through gateway courses that enable students to learn fundamental problem solving skills, understand the engineering design process, acquire STEM content knowledge and help inform their decisions about college majors and professions. Course delivery is in a virtual and/or blended format. Courses will be primarily delivered via interactive video conferencing; however, some courses may be delivered in an asynchronous online format with a weekly synchronous webinar.

Program Details

All students enrolling in GSSM Accelerate and GSSM TEAM UP courses must have been accepted into each respective program and be currently in good academic standing. Students in the program must take all of the required courses for their grade level and maintain academic excellence throughout the program.

In addition to the virtual (interactive video and blended online) courses taken during the academic year, students in GSSM Accelerate and TEAM UP programs also participate in a number of summer and weekend activities as part of the program. Each summer, students will attend a mandatory one-week residential camp. Rising seniors also have the option to attend a longer in depth research experience if they would like. For students in the Accelerate Program, attendance is also required at several Saturday events during each school year. These include, but are not limited to, engineering and science labs on the Hartsville campus, visits to engineering companies around the state, and visits to university engineering departments.



Technology

GSSM Accelerate and TEAM UP students attend class, participate in discussions, work on group projects, and get after-class help through GSSM's innovative, statewide, high-definition (max 1080p30) video conferencing network. For a scalable video platform, GSSM Accelerate and TEAM UP use Zoom. This technology provides a top-quality video and sound experience for teachers and students, whether they are using room-size video facilities, computers, tablets, or phones. Each lecture and seminar is recorded and streamed simultaneously. Students who are unable to be in class can watch the live simulcast on their computer, tablet or phone.

Students also use GSSM's Global Application Infrastructure Network (GAIN) to access modeling and design tools like MATLAB and SolidWorks while at school or at home. GAIN

allows students to collaborate and complete assignments from nearly any internet-connected computer or tablet in the world. Files are stored in the cloud and student work is safe from loss due to power outages or computer failures. GSSM uses VMWare to create virtual desktops that virtual students can use securely in class, at home, and on nearly any Internet-connected device. VMWare forms the core of GAIN and in addition to providing access to modeling and design tools, it provides access to MS Office as well as instantly available cloud storage.

The Facilitator

Key to the success of the virtual classroom experience is the facilitator. The facilitator is an adult at the school site who works with the students and the GSSM Virtual Programs instructors to ensure a positive learning environment.

Expectations for facilitators include:

- Maintaining a safe, productive environment for students in the virtual classroom.
- Serving as the conduit for communication between GSSM and the school
- Performing certain classroom management functions
- Administering and proctoring tests and quizzes designed by GSSM instructors.
- Troubleshooting minor technical issues, such as muted volume, unplugged cables, or pointing and zooming the camera.
- Communicating with the GSSM instructors about school closures, schedule changes, or classroom issues that affect student learning.
- Receiving assignments and graded work from GSSM instructors.
- Sending completed assignments to GSSM instructors for grading.
- Communicating with parents, school counselors, and school administration about student performance

The facilitator is not required to be a subject-area teacher, though many schools have subject-area teachers participate as facilitator.

Dual Enrollment Courses

All GSSM virtual courses are offered for high school credit, and are *Honors* or *Dual Enrollment*, as noted in the course descriptions. Dual enrollment courses allow for both high school and college credit. Credits are contingent upon satisfactory completion of all course requirements.

Courses offered for both college and high school credit will be certified via a master dual enrollment agreement between Coker University and GSSM. Students are enrolled in Coker University as “special students”.



College credits are awarded as noted, provided students meet all requirements of both GSSM Virtual Programs and the appropriate partner college/university. No college credit shall be awarded for grades below C.

Completion of a GSSM Virtual program does not guarantee admission into any partner college/university. Students must apply to, and be accepted by, the university and department in which they wish to enroll. Admission of the student and the granting of these credits are solely the province of the college/university partner.



Accelerate Curriculum Overview

	10 FALL	10 SPRING	11 FALL	11 SPRING	12 FALL	12 SPRING
MATH	Honors Precalculus for Engineers		MATH 222 Calculus I		MATH 223 Calculus II	
ENGINEERING	Honors Pre-Engineering I	Honors Pre-Engineering II	EGR 102 Engineering Disciplines & Skills	EGR 141 MATLAB Programming	Honors Senior Project	EGR 115 Engineering Design & Modeling
SCIENCE			CHE 101 & CHE 101L General Chemistry I and Lab	CHE 102 & CHE 102L General Chemistry II and Lab	PHY 203 & PHY 203L Calculus Physics I and Lab	PHY 204 & PHY 204L Calculus Physics II and Lab
ENGLISH/ LANG ARTS			ENG 101 English Composition and Rhetoric I	ENG 102 English Composition and Rhetoric II	ENG 215D Writing in STEM	ENG 220 Truth and Consequence
ELECTIVES (optional) Open to all grades	FALL SEMESTER ELECTIVES <ul style="list-style-type: none"> CS 110 Computer Science I CS 111 Computer Science II BA 223 Microeconomic Concepts 			SPRING SEMESTER ELECTIVES <ul style="list-style-type: none"> Honors Biomedical Engineering Honors Mechanical & Aerospace Engineering 		

BLUE indicates honors courses

GREEN indicates dual enrollment courses

Blended courses include a combination of synchronous (real-time) instruction with online learning activities

Applicants must successfully complete Algebra I prior to the beginning of 9th grade, and project successful completion of Algebra II by the end of 9th grade.

Prior to the beginning of 11th grade, students should complete:

- Biology I
- Chemistry 1
- Geometry
- English II

Standard High School Graduation Requirements Standard Credit Units (1 year = 1 credit)

Math	4
Science (incl Biology)	3
Computer Science	1
English/Language Arts	4
Foreign Language	1
US History	1
Government/Economics	1
Other Social Studies	1
Physical Ed/ROTC	1
Electives	7
Total	24

TEAM UP Curriculum Overview

	10 FALL	10 SPRING	11 FALL	11 SPRING	12 FALL	12 SPRING
MATH	Honors Algebra III	Honors Precalculus	MATH 222 Calculus I			
	OR					
	Honors Precalculus					
ENGINEERING	Honors Foundations in Engineering (Synchronous or Blended)		Honors Civil & Environmental Engineering (Blended)	Honors Mechanical & Aerospace Engineering (Blended)	EGR 102 Engineering Disciplines & Skills	EGR 141 MatLab
			Honors Engineering, Technology & Society	Honors Agriscience, Biotechnology & Agricultural Engineering	Honors Senior Research & Design Project (Blended)	
					Honors Electrical Engineering (Blended)	Honors Biomedical Engineering (Blended)
SCIENCE	Honors Chemistry I		Honors Intro to Computational Science (Blended)	Honors Intro to Industrial Chemistry & Engineering (Blended)	Honors Physics	PHY 203/203L Calculus Physics II and Lab

BLUE indicates honors courses

GREEN indicates dual enrollment courses

Blended courses include a combination of synchronous (real-time) instruction with online learning activities

Applicants must successfully complete Algebra I prior to the beginning of 9th grade, and project successful completion of Algebra II by the end of 9th grade.

Prior to the beginning of 11th grade, students should complete:

- Biology I
- Chemistry 1
- Geometry
- English II

Standard High School Graduation Requirements Standard Credit Units (1 year = 1 credit)

Math	4
Science (incl Biology)	3
Computer Science	1
English/Language Arts	4
Foreign Language	1
US History	1
Government/Economics	1
Other Social Studies	1
Physical Ed/ROTC	1
Electives	7
Total	24

*Please note that for the fall semester of 2020, TEAM UP juniors will take Honors Forensics in lieu of Honors Engineering, Technology, and Society.

Course Descriptions

Engineering

Pre-Engineering 1 (Honors)

SCDOE No. 692400HH

0.5 HS Credit (units) Fall

Pre-Engineering 1 offers students an introduction to engineering, discussing careers and highlighting South Carolina-based industries. Introduces professional, ethical, and societal issues appropriate to engineering. Various forms of technical communication are emphasized. This course is integrated with Pre-calculus.

Prerequisite: *Algebra II*

Pre-Engineering 2 (Honors)

SCDOE No. 692500HH

0.5 HS Credit (units) Spring

Provides a solid foundation of skills to solve engineering problems. Students demonstrate problem-solving techniques with units and dimensions, use modeling techniques and interpret validity of experimental results, learning "thinking like an engineer". The course is integrated with Pre-calculus.

Prerequisite: *Pre-Engineering 1*

EGR 102 Engineering Disciplines and Skills (Dual Enrollment)

SCDOE No.: 806400EW

1.0 HS Credit (units) Fall

College credit: 3SH

Provides solid foundation of skills to solve engineering problems. Students demonstrate problem solving techniques with spreadsheets, dimensions and units; use modeling techniques and interpret validity of experimental results. Students design projects on multi-discipline teams. Introduces professional and societal issues appropriate to engineering. Various forms of technical communication are emphasized.

Prerequisite: *Grade of C or better in Honors Pre-Engineering 2*

EGR 115 Engineering Design and Modeling (Dual Enrollment)

SCDOE No.: 805400EW

1.0 HS Credit (units) Spring

College credit: 3SH

This course is an introduction to engineering graphics and machine design. Students use hand sketching and CAD tools to visualize, communicate, rapid prototype, and analyze engineering problems. SOLIDWORKS software is used.

EGR 141 Programming and Problem Solving (Dual Enrollment)

SCDOE No.: 805300EW

1.0 HS Credit (units) Spring

College credit: 3SH

Students formulate and solve engineering problems using MATLAB; estimate answers for comparison to computed solutions; read, interpret and write programs, instructions and output; iterate, evaluate conditional statements; and debug. Various forms of technical communication are emphasized.

Prerequisite: *Grade of C or better in EGR 102*

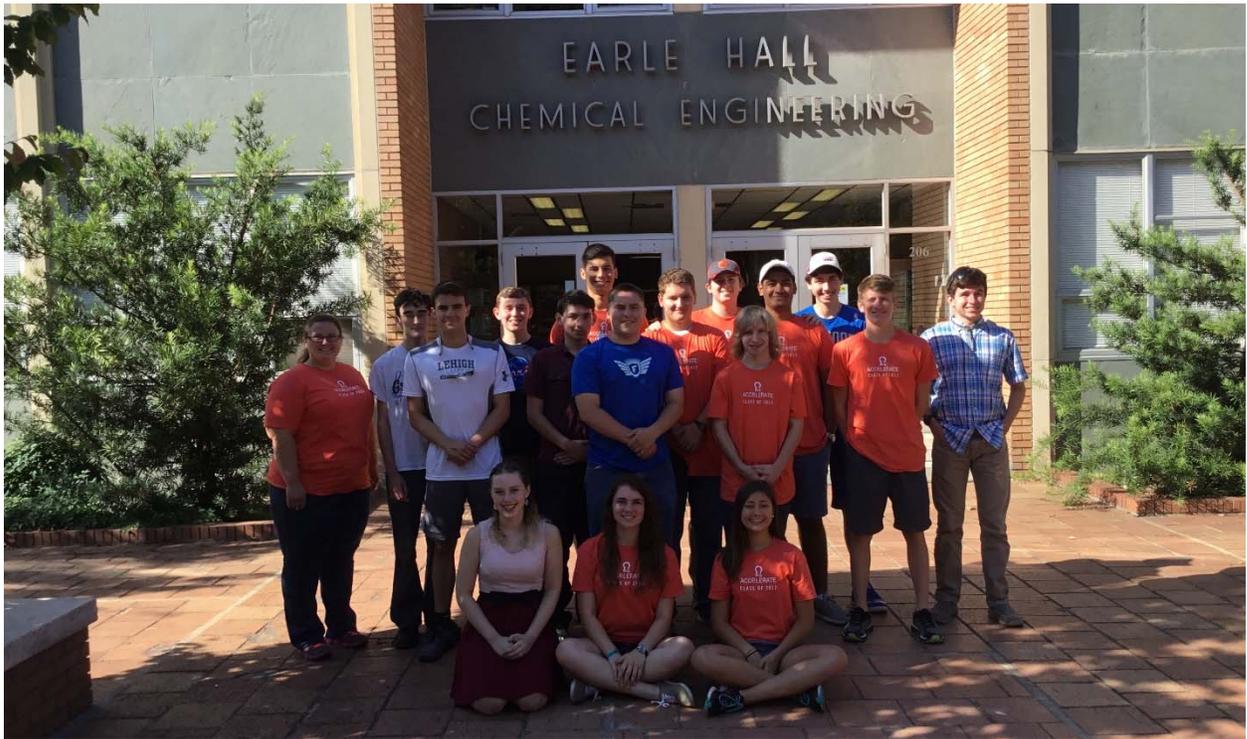
Senior Engineering Project (Honors)

SCDOE No.: 805900HH

0.5 HS Credit (units) **Fall**

The Senior Project course is an engineering capstone course designed for students to work through the engineering design process by selecting, researching and developing a new product or process. The product can be either an invention or innovation and the design process should include the development of a prototype. The process should include new methodology of a technical nature. Students continue applying the engineering design process and other skills taught and used in Pre-Engineering.

Prerequisite: *Grade of C or better in Honors Pre-Engineering 2*



English

ENG 101 English Composition and Rhetoric I (Dual Enrollment)

SCDOE No. 301500EW

1.0 HS Credit (units) Fall

College credit: 3SH

English 101 is the first half of the required two-course sequence in composition. This course introduces students to the modes of writing, with an emphasis on exposition and argumentation. The course also reviews basic processes of composing: inventing, planning, drafting, and revising. Students will learn how to develop ideas in a clear and logical manner, communicate their ideas coherently to their intended audience, and write in a correct and effective way. In addition to writing several in-class essays and short papers, students will learn the techniques and conventions of academic research. They will participate in at least one session on library and information technology. Fiction and nonfiction readings will provide discussion material and starting points for their writing.

ENG 102 English Composition and Rhetoric II (Dual Enrollment)

SCDOE No. 301600EW

1.0 HS Credit (units) Spring

College credit: 3SH

English 102 is the second half of the required two-course sequence in composition. This course advances students' critical reading and writing skills by exploring how writing creates knowledge and shapes meaning; therefore, student writing will involve both print and digital formats. Throughout the semester students will define terms, conduct research, evaluate and synthesize evidence in order to create clearly written, sustained arguments. Readings for each section of ENG 102 will explore a specific and unifying theme or question, and may include readings in fiction and non-fiction.

Prerequisite: *ENG 101*

ENG 215D Writing in STEM (Dual Enrollment)

SCDOE No. 403500EW

1.0 HS Credit (units) Fall

College credit: 3SH

In this course, students will investigate the circumstances and genres in which STEM professionals write. The course combines readings from scientific, engineering, and mathematics disciplines geared toward general audiences. Such readings will serve as the basis of writing and addressing specific audiences in the disciplines. Students should have completed at least one science course before taking the course or be co-registered for a science course.

Prerequisites: *ENG 102 and completion of or concurrently enrolled in a science course*

ENG 220 Truth and Consequence (Dual Enrollment)

SCDOE No. 403600EW

1.0 HS Credit (units) Spring

College credit: 3SH

Literature explores the great moral and ethical questions and this course combines historical and contemporary readings to examine the importance of this inquiry. Students will read works of fiction and non-fiction to explore the ways cultures at particular moments in time have determined what is right, good and appropriate. Moreover, students will explore how writers have addressed the ways individuals and groups have resisted or revered cultural constructions of stigmatized, demonized or vilified behaviors in various contexts and situations.

Prerequisite: *ENG 102*

Mathematics

Precalculus (Honors)

SCDOE No.: 413100HW

1.0 HS Credit (units) Fall/Spring

A survey of material needed to study calculus. Topics include systems of equations, matrix algebra, polynomial functions, rational functions, inverse functions, exponential and logarithmic functions, trigonometric and inverse trigonometric functions.

Prerequisites: *Algebra II or PI*

MAT 222 Calculus I (Dual Enrollment)

SCDOE No.: 413600EW

1.0 HS Credit (units) Fall/Spring

College credit: 4SH

Topics include limits and continuity, the derivative, differentiation of algebraic and trigonometric functions, applications of the derivative, indeterminate forms, basic integration techniques, and the Fundamental Theorem of Calculus.

Prerequisites: *Honors Precalculus*

MAT 223 Calculus II (Dual Enrollment)

SCDOE No.: 413700EW

1.0 HS Credit (units) Fall/Spring

College credit: 4SH

Topics include applications of integration, advanced integration techniques, improper integrals, parametric equations, polar coordinates, and infinite series.

Prerequisites: *Calculus I*



Science

Chemistry

CHE 101 and 101L General Chemistry I and Lab (Dual Enrollment)

SCDOE No.: 323900EW

1.0 HS Credit (units) **Fall**

College credit: 4SH

A course in basic chemical principles. Topics include: periodicity, stoichiometry, chemical and nuclear reaction types, coordination chemistry, atomic and molecular nomenclature, structure, and properties. **CHE 101L General Chemistry Laboratory accompanies CHE 101 and carries 1 credit**; it is designed to develop laboratory and mathematical skills through experiments that illustrate chemical concepts. Mandatory labs are scheduled on some Saturdays each semester.

Prerequisite: *Introduction to Chemistry or PI*

CHE 102 and 102L General Chemistry II and Lab (Dual Enrollment)

SCDOE No.: 324000EW

1.0 HS Credit (units) **Spring**

College credit: 4SH

An introduction to the principles of chemical kinetics and thermodynamics and their application to chemical reactions, with an emphasis on solution chemistry. **CHE 102L General Chemistry Laboratory accompanies CHE 102 and carries 1 credit**. It is a continuation of CHE 101L, focused on the development of quantitative and analytical laboratory skills. Mandatory labs are scheduled on some Saturdays each semester.

Prerequisite: *CHE 101*

Physics

PHY 203 and 203L Calculus Physics I and Lab (Dual Enrollment)

SCDOE No.: 324900EW

1.0 HS Credit (units) **Fall**

College credit: 4SH

A calculus-based course covering classical mechanics and dynamics. Topics include vector notation, kinematics, statics, dynamics, circular motion, work and energy, linear momentum, and rotational motion. **PHY 203L Calculus Physics Laboratory accompanies PHY 203 and carries 1 credit**. Experiments designed to illustrate the principles of physics covered in PHY 203. Mandatory labs are scheduled on some Saturdays each semester.

Prerequisites: *MAT 222 (Calculus I)*

PHY 204 and 204L Calculus Physics I and Lab (Dual Enrollment)

SCDOE No.: 325000EW

1.0 HS Credit (units) **Spring**

College credit: 4SH

A calculus-based course covering fluids, vibrations, waves, sound, electricity, magnetism, light, and optics. **PHY 204L Calculus Physics Laboratory II accompanies PHY 204 and carries 1 credit**. It includes experiments designed to illustrate the principles of physics covered in PHY204. Mandatory labs are scheduled on some Saturdays each semester.

Prerequisites: *PHY 203*

Online Elective (Optional) Courses

These courses will be delivered in a blended format online course with a weekly interactive teacher led evening webinar. The classes will include a combination of design projects, problem sets, lectures, discussions, group work, labs, demonstrations, and activities.

Computer Science

CS 110 Computer Science I (Dual Enrollment)

SCDOE No. 502600EW

1.0 HS Credit (units) **Fall**

College credit: 4SH

An introduction to computer architecture, computer systems, number systems, logic circuits, and current software applications; fundamentals of computer programming and problem solving using a high level programming language applied to real world examples; basics of program-writing environment, simple data types, expressions, control structures, iteration, functions, arrays, and introduction to object-oriented programming.

CS 111 Computer Science II (Dual Enrollment)

SCDOE No. 502700EW

1.0 HS Credit (units) **Fall**

College credit: 4SH

Continuation of CS 110 Computer Science I including procedural and object-oriented programming techniques. Introduces abstract data types (ADTS) and linked data structures.

Prerequisite: *CS 110*

Economics

BA 223 Principles of Economics: Microeconomic Concepts (Dual Enrollment)

SCDOE No. 335800EW

1.0 HS Credit (units) **Fall**

College credit: 3SH

Microeconomics gives students a thorough understanding of the principles of economics that apply to the functions of individual decision makers, both consumers and producers, within the economic system. It places primary emphasis on the nature and functions of product markets and includes the study of factor markets and of the role of government in promoting greater efficiency and equity in the economy.

Prerequisite: *Algebra II*



Engineering

Biomedical Engineering (Honors)

SCDOE No. 793000HW

1.0 HS Credit (units) Spring

This course introduces students to the different sub-specialties of biomedical engineering (BME) including bioelectricity, biomedical instrumentation, biomaterials, and biomechanics. Through hands-on labs, design projects, problem sets, and research article review, students explore and experience the engineering design process, problem solving and troubleshooting in the field of BME. Some questions that might be addressed are: "how are electrical signals from the heart measured outside the body?", "is there a way to design high heel shoes that don't hurt women's feet?", and "how do engineers design heart valves that only allow blood flow in one direction?".

Mechanical and Aerospace Engineering (Honors)

SCDOE No. 793100HW

1.0 HS Credit (units) Fall and Spring

This course introduces students to the fields of mechanical and aerospace engineering. It integrates engineering design, core math and science concepts needed to solve problems related to aerospace and mechanical engineering as well as other engineering disciplines. The course includes historical context and addresses the following topics: statics, thermodynamics, fluid dynamics, materials, and mechanics of flight. Through the use of hands-on labs, design projects, problem sets, and demonstrations students learn how engineers use mathematics and science to design efficient and beneficial devices such as automobiles, power plants, airplanes, machinery, and heating/cooling equipment. Students have opportunities to experiment, calculate, compute, design, and build as they explore and solve problems.





TEAMUP

TEACHING. ENGAGING. ADVANCING MINDS.

TEAM UP Course Descriptions

Computational Science

Introduction to Computational Science (Honors)

SCDOE No. 795300HH

1.0 HS Credit (units) **Fall**

This course will examine the technologies, techniques, and tools of computational science. Computational science, not to be confused with computer science; looks to answer this question: "How can computers and mathematics be used to study interesting problems in science and social science?" Computational science is sometimes known as modeling and simulation or scientific computing; and looks to create and use mathematical models to study complicated and complex problems in all areas of study.

Engineering

Foundations in Engineering (Honors)

SCDOE No. 792400HW

1.0 HS Credit (units) **Fall/Spring**

This course introduces students to the various fields of engineering, the engineering design process, and engineering careers. Students apply core math and science concepts that encompass all fields of engineering. The course introduces professional, ethical, and societal issues in engineering and technical communication needed for successful engineering practices. The course concludes with a capstone design project.

Engineering, Technology & Society (Honors)

SCDOE No. 792500HH

0.5 HS Credit (units) **Fall**

In this course, students will explore the history of engineering and technology in its cultural, ethical, and scientific context. This multifaceted course uses a combination of historical readings, projects, and labs to illuminate the development and relevance of this history.

Agriscience, Biotech, and Agricultural Engineering (Honors)

SCDOE No. 792600HH

0.5 HS Credit (units) **Spring**

This interdisciplinary course is designed to allow the learner to use historical data to analyze, interpret, and evaluate the influence of the past on contemporary issues. More specifically, the learner will examine how the invention of farm machinery in the 20th century revolutionized the growing of crops in the American South. Students will also study the present day intersection between biotechnology, agriscience and agricultural engineering to gain an understanding of current practices. They will examine how farms around the world are intensify agriculture and promoting sustainability. They will learn about and build agricultural smart devices.

Introduction to Industrial Chemistry and Engineering (Honors)

SCDOE No. 792700HH

0.5 HS Credit (units) **Spring**

This interdisciplinary course focuses on the industrial practice of chemistry. It provides students with a real-world perspective thereby creating an awareness of the relevance of chemistry to their daily lives. For example, students will learn in a chronologically historical sequence about major developments in industrial chemistry, such as ammonia, aluminum, and nylon that have significantly affected people's lives. Students will engage in individual and group online activities.

Biomedical Engineering (Honors)

SCDOE No. 793000HW

1.0 HS Credit (units) Spring

This course introduces students to the different sub-specialties of biomedical engineering (BME) including bioelectricity, biomedical instrumentation, biomaterials, and biomechanics. Through hands-on labs, design projects, problem sets, and research article review, students explore and experience the engineering design process, problem solving and troubleshooting in the field of BME. Some questions that might be addressed are: "how are electrical signals from the heart measured outside the body?", "is there a way to design high heel shoes that don't hurt women's feet?", and "how do engineers design heart valves that only allow blood flow in one direction?"

Civil and Environmental Engineering (Honors)

SCDOE No. 793200HH

0.5 HS Credit (units) Fall

This course introduces students to the study and practice of civil and environmental engineering and to math and science concepts needed to solve problems related to these and other engineering disciplines. Topics include engineering design, statics and strength of materials, hydrology, pollutant fate and transport, and environmental modeling. Activities include small-scale laboratory explorations, design projects inspired by the profession, field measurement, online data acquisition and computational modeling.

Mechanical and Aerospace Engineering (Honors)

SCDOE No. 793100HW

1.0 HS Credit (units) Spring

This course introduces students to the fields of mechanical and aerospace engineering. It integrates engineering design, core math and science concepts needed to solve problems related to aerospace and mechanical engineering as well as other engineering disciplines. The course includes historical context and addresses the following topics: statics, thermodynamics, fluid dynamics, materials, and mechanics of flight. Through the use of hands-on labs, design projects, problem sets, and demonstrations students learn how engineers use mathematics and science to design efficient and beneficial devices such as automobiles, power plants, airplanes, machinery, and heating/cooling equipment. Students have opportunities to experiment, calculate, compute, design, and build as they explore and solve problems.

Mathematics

Algebra III (Honors)

SCDOE No.: 411300HW

1.0 HS Credit (units) **Fall**

This course is designed to develop knowledge of advanced functions, provide a conceptual understanding of their underlying expressions and give students an opportunity to develop algebraic skills for solving real-world problems. Emphasis is placed on using mathematics as a tool for problem solving, simple mathematical modeling and engineering applications. Topics include data analysis, introduction to functions and their graphs (linear, quadratic, exponential, and logarithmic functions), solutions to equations and inequalities, solutions to systems of equations, recursive equations, matrix algebra, and elementary trigonometry.

Prerequisite: *Algebra II*

Precalculus (Honors)

SCDOE No.: 413100HW

1.0 HS Credit (units) **Spring**

This course provides students with foundational knowledge in preparation for the study of calculus. Emphasis will be placed on engineering problem solving. Topics include polynomial and rational functions, quadratic functions and models, polynomial functions and their graphs, exponential and logarithmic functions and trigonometric and inverse trigonometric functions.

Prerequisite: *Algebra II or Algebra III*

MAT 222 Calculus I (Dual Enrollment)

SCDOE No.: 413600EW

1.0 HS Credit (units) **Fall/Spring**

College credit: 4SH

Topics include limits and continuity, the derivative, differentiation of algebraic and trigonometric functions, applications of the derivative, indeterminate forms, basic integration techniques, and the Fundamental Theorem of Calculus.

Prerequisites: *Honors Precalculus*

Science

Chemistry

Honors Chemistry I

SCDOE No.: 323100HW

1.0 HS Credit (units) **Fall/Spring**

This course is an in-depth study of the composition, properties, and interactions of substances. Topics include: atomic structure and nuclear processes; structure and classification of chemical compounds; types, causes and effects of chemical reactions; structure and behavior of the different phases of matter; and the nature and properties of chemical solutions. The standards for scientific inquiry will form the basis of instruction for the course.

Prerequisite: *Biology I and Algebra II*

Physics

PHY 203 and 203L Calculus Physics I and Lab (Dual Enrollment)

SCDOE No.: 324900EW

1.0 HS Credit (units) **Spring**

College credit: 4SH

A calculus-based course covering classical mechanics and dynamics. Topics include vector notation, kinematics, statics, dynamics, circular motion, work and energy, linear momentum, and rotational motion. **PHY 203L Calculus Physics Laboratory accompanies PHY 203 and carries 1 credit.** Experiments designed to illustrate the principles of physics covered in PHY 203. Mandatory labs are scheduled on some Saturdays each semester.

Prerequisites: *MAT 222 (Calculus I)*

Interdisciplinary

Honors Forensics

SCDOE No.: pending

0.5 HS Credit (units) **Fall**

This is an introductory course in forensic science, which covers the history and scope of forensics. Topics covered in this course range from crime scene investigations, physical evidence and analytical techniques for organic and inorganic materials; forensic toxicology; firearms, ammunition, unique tool marks, and various impressions (e.g., shoe prints, fabric properties, and bloodstains).

Prerequisite: