



# STEM FOUNDATIONS

GSSM'S ONLINE DIPLOMA PROGRAM

## COURSE CATALOG, 2023-2024

Classes in the STEM Foundations Program are taught live online via Zoom. Students take 5 courses each semester together with a seminar series. In their junior year, each student takes yearlong classes in biology, chemistry, English, history, and math. In their senior year, students take computer science, engineering, English, math, physics, and a capstone research class.

In addition to the typical semester courses, students participate in an Interim course each year. All students participate in a mentored research & inquiry experience during their time in the program. Details about the courses, Interim, and mentored research & inquiry experience are provided below.

### Junior Year Courses

The following table gives a summary of the courses that students will take each semester, full course descriptions are provided below.

	Fall	Spring
Biology	BIOLOGY 1 DC Biol 1: Core Principles of Cell and Molecular Biology & Lab (Dual Enrolled)	BIOLOGY 2 DC Biol 2: Core Principles of Organismal Biology & Lab (Dual Enrolled)
Chemistry	PRINCIPLES OF CHEMISTRY (Honors)	CHEMISTRY 101 (Dual Enrolled)
English	COLL ENG 111 DE English 111: Composition and Rhetoric I (Dual Enrolled)	COLL ENG 112 DC English 112: Composition and Rhetoric II (Dual Enrolled)
History	AP US History	
	MICROECONOMICS 201 DE Principles of Economics: Microeconomic Concepts (Dual Enrolled)	US GOVT 201 DC U.S. Government 201 (Dual Enrolled)
Math	MATH ANALYSIS 111-H (Precalculus Honors)	MATH ANALYSIS 112-H (Precalculus Honors)
	INTRO DE CALC HONORS (Calculus 1 Honors)	CALCULUS 201 DC (Calculus 1 Dual Enrolled)

### Senior Year Courses

The following table gives a summary of the courses that students will take each semester, full course

descriptions are provided below.

	Fall	Spring
Computer Science	AP INTRODUCTION TO COMPUTER SCIENCE	AP ADVANCED COMPUTER PROGRAMMING
Capstone		RESEARCH & INQUIRY CAPSTONE (Honors)
Engineering	PRE-ENGINEERING 1 H (Honors)	
English	WORLD LITERATURE I (Dual Enrolled)	WORLD LITERATURE II (Dual Enrolled)
Math	INTRO DE CALC HONORS (Calculus 1 Honors)	CALCULUS 201 DC (Calculus 1 Dual Enrolled)
	INTRO DE CALC II HONORS (Calculus II Honors)	CALCULUS 202 DC
Physics	PHYSICS 1A DC (Dual Enrolled)	PHYSICS 1B DC (Dual Enrolled)

**Interim:** Interim occurs in January after winter break and before spring semester starts. During interim, students engage with a single creative elective course for 2.5 weeks. Students in the GSSM STEM Foundations Program take this class together. Depending on the comfort level of all students, interim could involve optional travel around the state of SC.

**Mentored Research & Inquiry Experience:** All students participate in a mentored research & inquiry experience—for most STEM Foundations students, this experience will take place in the senior year RES 412 class. STEM Foundations students will also have the option to request to do a summer research project. Students who request a summer research project will be accommodated as space allows and will complete a six-week mentored research project. Students doing a summer research will also complete a research & inquiry portfolio and present their work at the GSSM Annual Research Colloquium. GSSM facilitates the placement of students into research & inquiry experiences. Research & inquiry experiences may be completed in person or remotely depending on student preferences and availability. Both RES 401 and RES 412 fulfill the Research & Inquiry requirement.

### Seminar Series

Students are required to enroll in the following courses in our seminar series. These classes meet once a week. These classes provide students with support in their transition to GSSM as well as preparation for the college application process. In order to receive their GSSM diploma, students are expected to attend and pass each of the seminar courses.

	Fall	Spring
Junior Seminars	LLS 102: Academic Transition	LLS 103: College Planning Seminar I

Seniors also take the LLS 107: Preparing for Research Seminar during Interim their senior year. This seminar prepares them for the RES 412 Research class in the spring semester.

## COURSE DESCRIPTIONS

### COMPUTER SCIENCE COURSES

**AP INTRODUCTION TO COMPUTER SCIENCE** [Introduction to Computer Science \(AP CS A\)](#) (FALL Semester-0.5 unit)  
General concepts of sequential execution, conditional execution, iterative structures, recursive techniques and algorithm development are introduced in this one-semester course. In addition, general principles of program construction and object-oriented programming, are covered thoroughly. The activities in class include writing algorithms for specific application problems and implementing the code for these projects. The primary focus of outside-of-class work is to write functioning, efficient, well-documented, well-constructed programs. If no computer science credit was earned prior to enrolling at GSSM and a student enrolls in this course, the student will be required to enroll and earn credit in an additional computer science course in order to meet the state computer science requirement of 1.0 units.

**AP ADVANCED COMPUTER PROGRAMMING** [Advanced Computer Programming \(AP CS A\)](#) (SPRING Semester-0.5 unit)  
A review of arrays, classes, and recursion will preface the continuation of the study of computer science in the second semester. The concepts of object-oriented programming including class declaration and design, inheritance, interfaces and polymorphism are integral to programming activities in this course. Abstract data types will be introduced and implemented by the study of the List interface and Java Linked Lists. Sorting and searching algorithms will be examined in order to determine efficiency and storage considerations. Students will be assigned exercises including short answer and free response projects similar to those found on the AP CS A exam. *PREREQ: CSC101-AP*  
Note: Completion of this course earns the final 0.5 credit of the 1.0 credit provided in CSC101 & CSC102 AP course sequence.

### ENGLISH COURSES

**COLL ENG 111 DE** [English111: Composition and Rhetoric I](#) (FALL Semester)  
Dual Enrolled with Coker  
English 111 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.

**COLL ENG 112 DC** [English 112: Composition and Rhetoric II](#) (SPRING Semester)  
Dual Enrolled with Coker  
English 112 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. 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, poetry, and nonfiction readings will

provide discussion material and starting points for their writing. *PREREQ: ENG111*

**World Literature I** (FALL Semester)  
A study of literary works covering a diverse range of cultures, time periods, and genres. Students will consider how and why cultures produce literature, while learning to interpret and understand different types of texts. By the end of each course, students will describe how literature builds social, cultural, and ideological understanding. This first course in the sequence covers works from the ancient and pre-modern periods *PREREQ: ENG 111 or equivalent*

Enrolled with Coker (Coker ENG 207)

**World Literature II** (SPRING Semester)  
A study of literary works covering a diverse range of cultures, time periods, and genres. Students will consider how and why cultures produce literature, while learning to interpret and understand different types of texts. By the end of each course, students will describe how literature builds social, cultural, and ideological understanding. This second course in the sequence covers works starting with the early modern period. Prerequisite: ENG 111 or equivalent.

## HISTORY COURSES

AP United States History  
This full-year advanced placement course traces the major events, trends, and themes of American life from the colonial era to the present. Outside reading assignments, including primary sources, enhance the understanding of America's past while showing its connection to our present time. The fall semester includes a study of the Constitution and the origins and functions of the federal government.

Principles of Economics: Microeconomic Concepts (FALL Semester)  
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.

US Government 201 (SPRING Semester)  
A study of the American political institutions with special attention given to the reciprocal relationships between the individual, social and political spheres.

## MATH COURSES

Math Analysis 111/112 H (Pre-Calculus)  
A two-semester sequence that is designed to prepare students for the study of calculus. First semester topics include linear functions, polynomial functions, rational functions, exponential functions, logarithmic functions, function composition and transformations. Spring semester topics include trigonometry, parametric and polar equations, and partial fractions.

Calculus I (Fall Semester is Honors Prep for DE Calculus I, Spring semester is Dual Enrolled Calculus I)  
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. The fall semester of this class meets 3 hours per week and is an honors course. The spring semester meets 4 hours per week and receives dual enrolled credit for Calculus 1. *PREREQ: Pre-Calculus*

Calculus II (Fall Semester is Honors Prep for DE Calculus II, Spring semester is Dual Enrolled Calculus II)  
Topics include techniques of integration, applications of integrations, improper integrals, infinite series, and polar and parametric equations. The fall semester of this class meets 3 hours per week and is an honors course. The spring semester meets 4 hours per week and receives dual enrolled credit for Calculus 1. *PREREQ: Calculus I or AP Calculus AB*

## RESEARCH & INQUIRY COURSES

Mentored Summer Research & Inquiry (SUMMER/FALL – 0.5 unit)  
Students will conduct a six-week, research & inquiry project under the guidance of a research mentor with experience & expertise in their field. Students are responsible for meeting any requirements of the project site (e.g., documentation, participating in a poster presentation, etc.). The mentor and project must be approved or assigned by GSSM. Students prepare their GSSM Research & Inquiry Portfolio prior to the start of the Fall Semester. During the Fall semester, students work at a seminar level with a GSSM Research Advisor to complete preparation to present at the GSSM Annual Research Colloquium. This presentation is required to receive credit. The course does not count toward course load for the Fall Semester of the senior year. *PREREQ: Preparing for Research Experiences Seminar in Spring of Junior Year*

Research and Inquiry Capstone Honors **Research & Inquiry Capstone (SPRING)**  
 Students will work in collaborative teams under the mentorship of the instructor to develop, test, and apply solutions to address challenges in on-going interdisciplinary projects. Students will work with their instructor to develop hypotheses, design tests, evaluate progress, troubleshoot difficulties, analyze data, and contextualize their discoveries within their field. Students will create and present a portfolio representing the challenge addressed, their methods, and their findings. This course fulfills the Research and Inquiry requirement at GSSM. *PREREQ: Preparing for Research Experiences Seminar in Spring of Junior Year*

## SCIENCE COURSES

Biology 1 DC Dual Enrolled with Coker **Biol 1: Core Principles of Cell and Molecular Biology and Lab (FALL Semester)**  
 An in-depth introduction to the principles of cell and molecular biology with emphasis in physiology of the cell, biochemistry, molecular biology and molecular genetics. The fundamental principles of thermodynamics and physical chemistry will be reviewed and their relationships to cell structure and function will be studied. The historical progression of discoveries and the framework of the major concepts of cellular and molecular biology will be discussed. BIO 110L accompanies BIO 110 and is a laboratory-based study of cell and molecular biology.

Biology II DC Dual Enrolled with Coker **Biol 2: Core Principles of Organismal Biology and Lab (SPRING Semester)**  
 A study of the diversity of organisms, their phylogeny, characteristic architectural features, physiological processes, and human importance. The nature of scientific inquiry will be explored through examples of how biologists acquire and continuously modify the understanding of organismal biology. BIO 111L is a laboratory-based study of organismal biology. This course will emphasize the diversity of organisms and the differences and similarities among organismal lineages.

Principles of Chemistry/C hemistry 101 Honors in Fall & Dual Enrolled with Coker in Spring **Principles of Chemistry/Chemistry 101 I and Lab (Fall Semester is Honors Prep for DE Chemistry; Spring Semester is Dual Enrolled General Chemistry I)**  
 A course in basic chemical principles. Topics include: periodicity, stoichiometry, chemical and nuclear reaction types, coordination chemistry, atomic and molecular nomenclature, structure, and properties. Additional topics in this course for STEM Foundations students include liquid properties, acid/base chemistry, equilibrium, and kinetics. This course includes a lab component. Development of laboratory and mathematical skills through experiments designed to illustrate chemical concepts. The fall semester of this class will be taught at the honors level and the spring semester will be dual enrolled.

Pre-Engineering 1 H Honors **Pre-Engineering I H (FALL Semester)**  
 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.

Physics 1A [Physics 1A DC & Lab](#) (FALL Semester)

DC An algebra-based introduction to classical mechanics and dynamics. Topics include 1D and 2D kinematics, vector notation, Newton's laws of motion, circular motion, gravity, work, energy, and linear momentum.  
Dual  
Enrolled Students will develop analytical thinking, reasoning, and scientific critical thinking skills through in-class activities, weekly experiments, and regular homework assignments. Includes a weekly lab.  
with Coker

Physics 1B [Physics 1B DC & Lab](#) (SPRING Semester)

DC An algebra-based continuation of Newtonian mechanics and introduction to waves, electricity, and magnetism. Topics include rotational motion, statics, vibrations, mechanical waves, sound, electrostatics, DC circuits, magnetism, and optics. Students will develop analytical thinking, reasoning, and scientific critical thinking skills through in-class activities, weekly experiments, and regular homework assignments. Includes a weekly lab. *PREREQ: 201/202L*  
Dual  
Enrolled  
with Coker

## SEMINAR DESCRIPTIONS

### LLS 102 [Academic Transition](#) (FALL semester; junior year)

This seminar is designed to assist students with the academic transition to GSSM. Students will be introduced to the resources and opportunities available to them at GSSM and will learn how to develop the skills and mindset necessary to thrive in the fast-paced and challenging GSSM academic environment.

### LLS 103 [College Planning Seminar I](#) (SPRING semester; junior year)

The College Planning Seminar I course is designed to teach students how to navigate both the college search and college application processes. The course will emphasize the importance of self-awareness and reflection in the process. Students will also learn how to identify college/universities that match what they are looking to gain in a collegiate experience. The tools and resources shared in the course will allow students to have a thoughtful and guided college search experience.

### LLS 104 [College Planning Seminar II](#) (FALL Semester; senior year)

The College Planning Seminar II course continues the college application process for the fall of senior year. Students will confirm their college application list, complete college applications and essays, and submit requests to have official documents sent to colleges. Completion of financial aid forms (FAFSA and CSS Profile) will also be covered. This fall seminar focuses on time management skills, organizational skills, submission of college applications and communication with colleges as an applicant. The seminar meets once a week; students may be excused from attending once their applications have been submitted to colleges.

### LLS 107 [Preparing for Research Experiences](#) (INTERIM, senior year)

This 4-week seminar series will provide an introduction to skills and concepts central to student research experiences. Students will work with peer-reviewed research papers to learn about scientific process, research narratives, how to read and understand research articles, develop annotated bibliographies, data analysis, basic statistics, and communication.

## DUAL-ENROLLMENT AGREEMENT INFORMATION

GSSM has dual-enrollment agreements with Coker University and Francis Marion University through which our students receive Coker University or Francis Marion University credit for certain courses.

- Dual-enrollment courses are those for which GSSM students simultaneously earn high-school and college credit. College credit for GSSM's dual-enrollment courses is granted by Coker University and Francis Marion University (FMU). Both are accredited by the Southern Association of Colleges and Schools Commission on Colleges (SACSCOC or SACS), which is the recognized regional accrediting body in the southeast.
- GSSM faculty teach our dual-enrollment courses in the same way they teach all our residential or virtual classes. GSSM faculty grade all work in the courses and assign students their grades. The courses are approved by Coker or FMU as meeting the same learning objectives as the Coker or FMU courses for which they receive credit.
- Dual-enrolled courses taken while enrolled at GSSM receive the same GPA credit as AP or IB courses, higher than courses designated as "honors." One 3-hour dual-enrolled course (taken in

one semester) earns one unit of high school graduation credit.

- As with credits from most SACS-accredited colleges, credits from Coker and FMU are transferrable to other similarly accredited institutions. In addition, most schools within South Carolina have agreements in place that allow for the transferring of college credits. For instance, credits earned through Coker or FMU can be transferred to, among other schools, the University of South Carolina and Clemson University. GSSM students who receive a "C" or higher ( $\geq 70/100$ ) in their dual-enrollment courses are usually able to transfer their Coker University and FMU credits to other colleges and universities in South Carolina (and, in many cases, to other institutions across the Southeast). Letter grades below a "C" ( $\leq 70/100$ ) are almost always ineligible for credit transfer, though they will most likely remain on the student's transcript when it is sent to the institution of matriculation. Colleges and universities set their own transfer policies so students should confer with the college about its specific transfer credit policies.
- Coker and FMU will issue a transcript showing the college credit earned at Coker or FMU for each dual-enrollment class a few weeks after final grades are submitted. Official transcripts may be requested for a small fee.
  - Follow the process here (<https://www.coker.edu/offices-services/academic-records/>) for Coker University transcripts. Note: Scroll down to How can I order a copy of my transcript? Follow the process here (<https://www.fmarion.edu/registrar/transcript/>) for Francis Marion transcripts. Note: FMU will also send students an official transcript each year.

Students should also be aware that grades earned in dual-enrolled courses are used in calculating eligibility for the LIFE Scholarship. See [https://che.sc.gov/sites/che/files/Documents/General%20Public/FAQ-LIFE-3\\_2021.pdf](https://che.sc.gov/sites/che/files/Documents/General%20Public/FAQ-LIFE-3_2021.pdf) for FAQ about the LIFE Scholarship.

The tables below specify the course equivalencies and credits granted by Coker University and Francis Marion University. Please see the student handbook for more information on dual enrollment.

University Course	Credit Hours	STEM Foundations Course
Francis Marion University ECON 204	3	Microeconomics 201 DE Principles of Economics: Microeconomic Concepts
Coker University BIO 110/110L	4	Biology 1 DC Biol 1: Core Principles of Cell and Molecular Biology and Lab
Coker University BIO 111	4	Biology II DC Biol 2: Core Principles of Organismal Biology and Lab
Coker University CHE 101/101L	4	Principles of Chemistry Honors and Lab/Chemistry 101 DE
Coker University ENG 111	3	COLL ENG 111 DE English 111: English Composition and Rhetoric I
Coker University ENG 112	3	COLL ENG 112 DC English 112: English Composition and Rhetoric II
Coker University ENG 207	3	World Literature I

Coker University ENG 209	3	World Literature II
Coker University MAT 231	4	Intro DE Calc Honors/MAT 231 Calculus 201 DC
Coker University MAT 232	4	Intro DE Calc II Honors/Calculus 202 DC
Coker University PHY 201/201L	4	Physics 1A DC & Lab
Coker University PHY 202/202L	4	Physics 1B DC & Lab
Coker University POL 201	3	US Govt 201 DC