

2016 Girls in STEM Summer Initiative

Program Framework

Program Overview

Columbia University’s School of Professional Studies is expanding its renowned summer programs for high school students to include a girls only week long STEM intensive. The program will be piloted in four cities (New York, San Francisco, Miami and Washington) during the 2016 summer. This innovative program will work with a small cohort (25-30 participants) of high school age girls to provide a rigorous academic experience combined with leadership development and college readiness experiences. The program is tuition free for qualified applicants with the target audience for the program being high school age girls who live in the four cities and who would otherwise not be able to afford a Columbia University summer experience.

Students will spend each day participating in a rigorous academic program modeled after Columbia’s other high school programs. The academic program will be experiential and engaging with a focus on STEM related field of study. The students will also spend time during the intensive developing leadership skills for young women and being introduced to college readiness experiences.

Weekly Schedule

Time	Activity
8:30am to 9:00am	Morning Advisory
9:00am to 10:00am	Building College Skills Program
10:00am to 12:00pm	STEM Academic Course
12:00pm to 1:00pm	Lunch
1:00pm to 2:00pm	Leadership Speaker Series
2:00pm to 4:00pm	STEM Academic Course
4:00pm to 5:00pm	Getting Ready for College Advisory

Morning Advisory

Each morning of the program, the students will participate in a morning advisory. The purpose of the advisory is to strengthen the cohort of students and their relationships with each other and to provide structured social and emotional supports to the students to ensure they have a successful experience in the program. Daily programming will include:

- An icebreaker utilized to build relationships between the students and supports the site staff in assessing how the students are doing to start each day.
- A mini-lesson on strands of the growth mindset including responsibility, resiliency and building meaningful relationships.
- A daily message that will be the guiding principle for a day and reinforced in a given day.

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Building College Skills Program (9am to 10am)

The college skills program teaches students foundational skills related to successfully navigating college. Each day will focus on a different topic of instruction that pertains one of the following important college readiness skills. The college skills program utilizes one of two tracks depending on the needs and existing skills of students including:

Study Skills & Research Techniques

Students practice the skills required to complete college assignments productively and to do research in a university library. Extensively considered are time management, note-taking, outlining, examination preparation, and effective class participation. Students are trained to use the full resources of a library, including traditional research tools as well as computerized catalogs, abstracts, indexes, and bibliographic databases.

Introduction to College Level Writing

The process of writing is emphasized as students learn to write through a "building block approach" which concentrates on how relatively simple meaning relationships and rhetorical strategies within an essay combine to yield intricate and sophisticated results. Attention is paid to developing skills in grammar, diction, usage, syntax, and punctuation.

Academic Course(s) (10am to 12pm / 2 to 4pm)

Students will spend each day participating in a rigorous academic program modeled after Columbia's other high school programs. The academic program will be experiential and engaging with a focus on STEM related field. Courses being created/utilized include the following:

Introduction to Computer Science: An 18 hour course covering an overview of fundamental computing concepts, as well as an introduction to hands on programming in Python and C++. Students produce a game based product/project at the end of the week long course.

Introduction to Materials Science: An 18 hour course introducing students to the field of Materials Science, a scientific discipline that is generally a) not familiar to teenagers and b) considered a male-dominated field. The course mixes traditional lecturing with practical demonstrations, guided discussions and a final short group project in which the students will research information on a material of their choice and present it to their classmates.

New Approaches to Math: An 18 hour course where students practice mathematics as an experimental, discovery-based science, solving open-ended problems through experimentation and creativity. During the course, students sample various branches of pure and applied mathematics and develop creativity, independent thinking, logical reasoning, and ability to rigorously support their ideas.

Science of Food: An 18 hour course introducing students to biology and chemistry concepts within the study of food. Course includes daily experiential learning opportunities and ends with participants producing research projects on women scientists.

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Leadership Program (1pm to 2pm)

Speaker Series (M, W, F): Invite local industry professionals to speak with participants on relevant topics pertaining to STEM careers, leadership in STEM and women in STEM. Students will be required to research guest speakers prior to visit (during advisory) and develop 1-2 questions to ask speaker after talk.

Girls Leadership (T, Th): Teams of five students create prototypes of STEM related technology/system/process that solves a community or world issue. Within the experience, topics of organization, planning, ethics, communication and goal-setting will be covered.

Getting Ready for College Advisory (4pm to 5pm)

Monday - The College Search

This presentation will focus on how to effectively search for colleges and the questions and considerations that a student should ask when determining if a school is right for them.

Tuesday - College Outside the Classroom

This presentation will discuss ways for students to supplement their academics with extracurricular opportunities on campus, such as clubs, student jobs, special events, study abroad, etc.

Wednesday - Building Your High School Resume

The college application process is a competitive one, so how can we help students to make their applications stand out and meet college expectations? This presentation will focus on that question and include topics such as enrolling in AP and honors classes, clubs, volunteering, etc.

Thursday - Ask Me Anything!

Current college students answer student questions about the typical college experience from a student perspective. Need to save time on Friday for overall closure of program and closing event.