

What courses do university STEM faculty say high school students should take to prepare to major in their fields?



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Architecture

SYRACUSE ARCHITECTURE

- Studio art classes: “extremely important”
- A solid background in physical sciences, including **physics**
- English and humanities classes
- Developed writing abilities
- Foreign language
- Speech or debate classes
- **Math, including trigonometry; calculus recommended but not required**



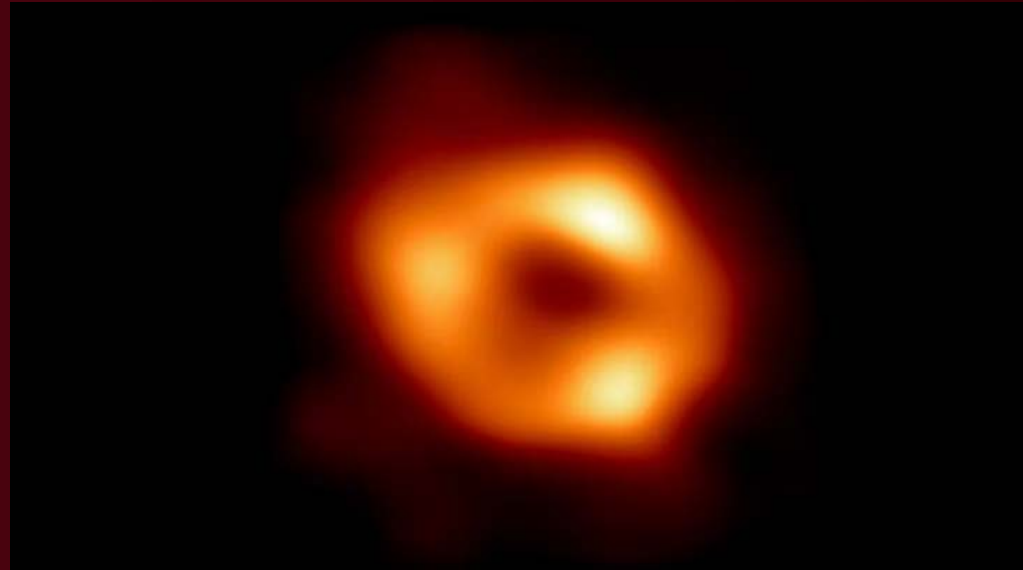
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Astronomy



College of Liberal Arts & Sciences
Physics & Astronomy

“Astronomy is applied Physics, applied using the tools of advanced mathematics, the technology of modern telescopes, and state-of-the-art computer software. As a high school student, you are encouraged to take any and all math and science classes available that can reasonably fit within your schedule, with **an emphasis on Physics and, if possible, Pre-Calculus and Calculus.** AP classes in Math or Physics should be taken as a preparation rather than a substitute for university-level classes.”



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Biology

IOWA STATE UNIVERSITY Biology Program

“...it is important to have a strong foundation in high school chemistry. Our office encourages students to complete **a minimum of one year of high school chemistry.**”

“A firm understanding of introductory level physics can lead to greater success for students enrolled in the Biology program. **One year of high school physics is recommended.**”

“Courses in Biology, such as Anatomy and Physiology, Genetics, and Advanced Sciences, are helpful for students entering the Biology program. However, **these courses should not take the place of the Chemistry and Physics courses.**”

“Our office encourages students to **complete Algebra I, Algebra II, Geometry, and Trigonometry in high school, if possible.**”



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Chemistry

“The ideal high school preparation to study chemistry and/or biochemistry includes **four years of college preparatory mathematics**, one year of **physics**, one year of **chemistry**, and one year of **biology**.”



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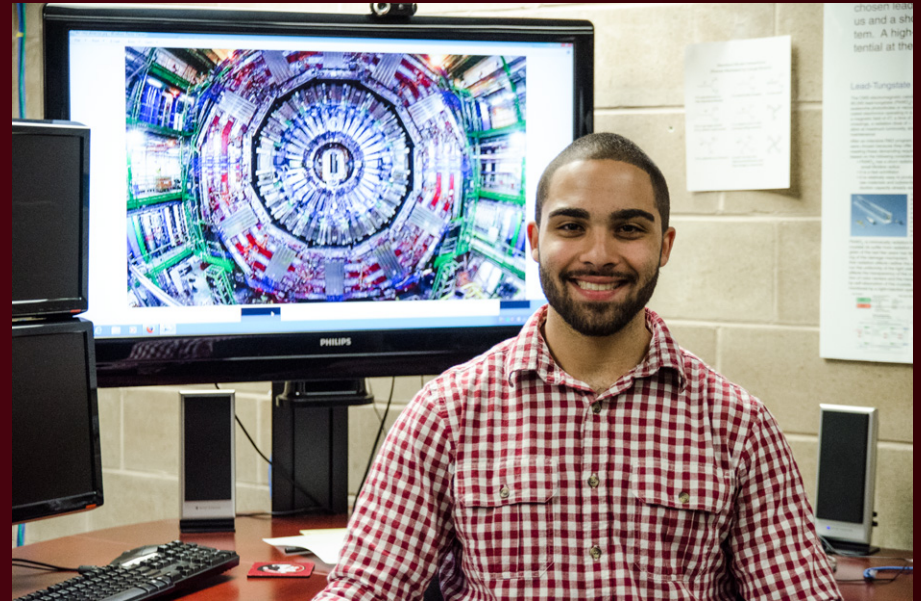


Computer Science

Department of Computer Science

College of Engineering and Computer Science@UCF

“...a strong background in math and science, including calculus and physics if possible, is key for success as a computer science major, said Gary Leavens, chairman of UCF’s computer science department.”



- “Florida continues computer science push, hoping to train more teachers, enroll more high school students”, *Orlando Sentinel*, July 18, 2019

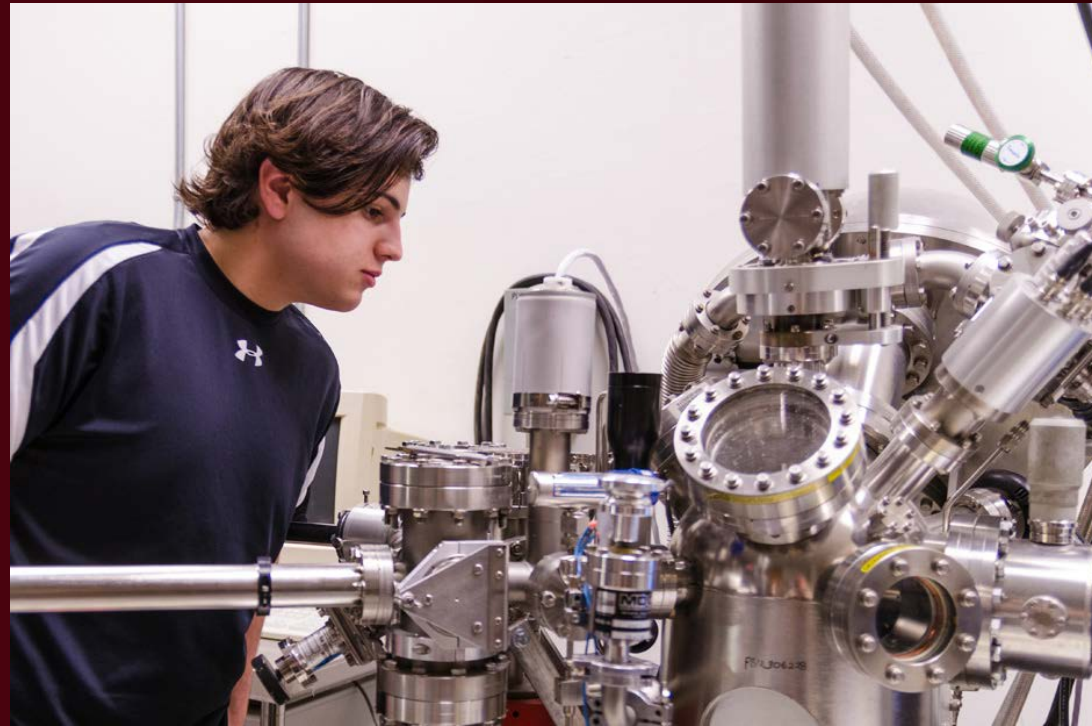


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Engineering



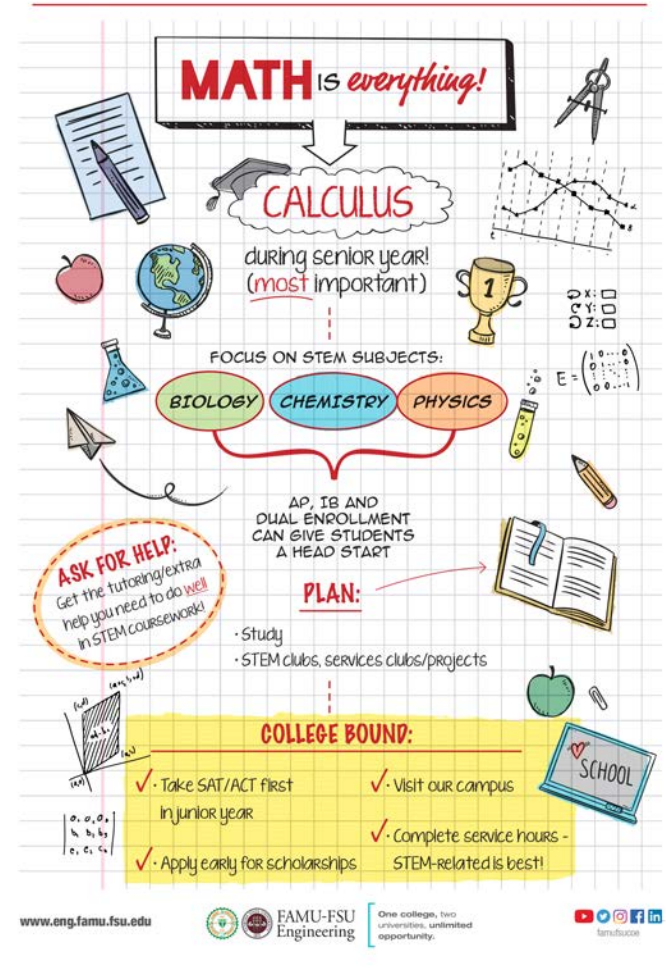
“Most engineering schools require four years of math, including **Pre-Calculus**, although **Calculus or AP Calculus is strongly encouraged**. Engineering schools are also looking for at least three years of science, including **Physics and Chemistry.**”



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ROADMAP TO ENGINEERING

Here's how to plan for success in college



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Meteorology

“In high school, students should take earth sciences, physics, chemistry and mathematics through at least pre-calculus. Generally, students who have completed a course in calculus and/or a course in computer programming will have an advantage when starting their Meteorology and Atmospheric Science studies.”



PennState
College of Earth
and Mineral Sciences

Department of
Meteorology and
Atmospheric Science



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Preparing for Pre-Med Studies

“The best thing you can do is build a good foundation of math and science coursework and, if available, take advanced classes. You may be able to receive Advanced Placement (AP) credit that could allow you to place out of basic requirements and move into upper-level coursework once you begin college. AP science and math options at your school may include **biology, chemistry, physics, calculus, and statistics**”



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A Simple Summary

Taking

Chemistry

Physics

Calculus



**in high school equips a student
for success in a wide range of
challenging fields!**



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42% of the national high school graduating class of 2019 had taken a physics course.

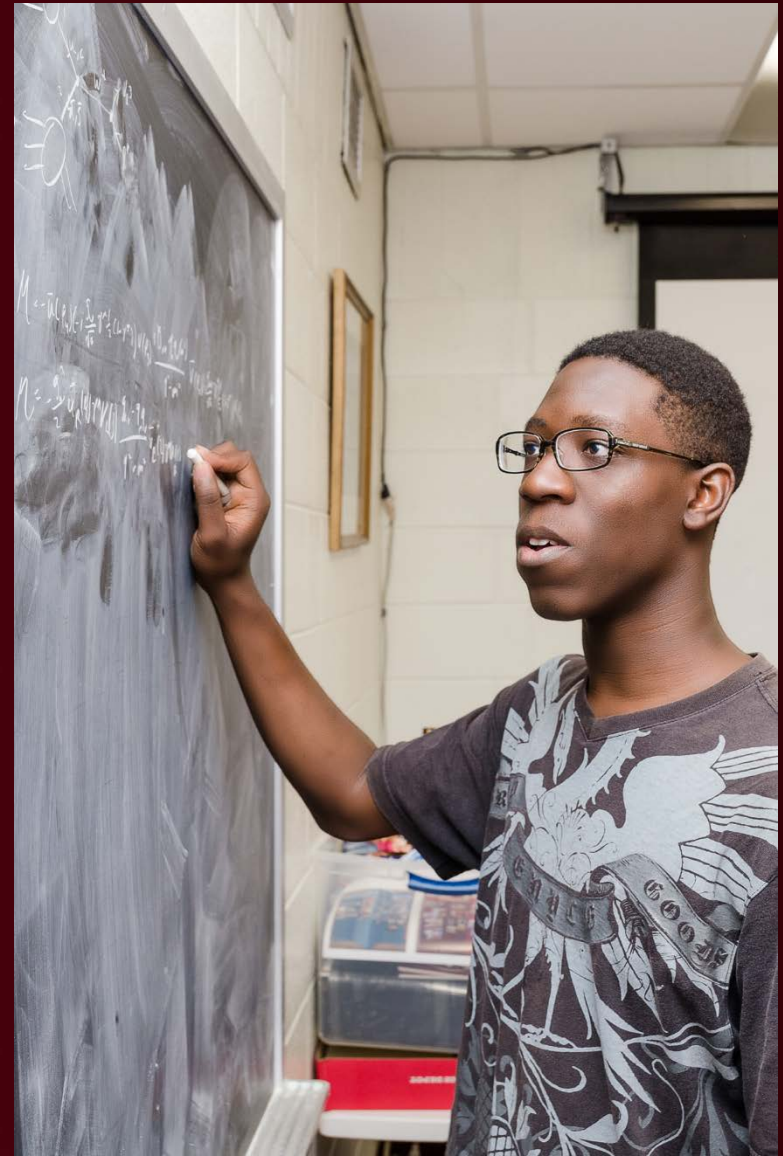
American Institute of Physics



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**15% of the nation's
recent high school
graduates have
taken a calculus
course.**

Education Week (2018)



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“It is the demand for these transferable competencies outside of STEM occupations that creates the persistent and growing demand for STEM talent and ultimately results in a wide scarcity of workers with those highly transferable STEM competencies.”

*- Georgetown University Center for Education and the Workforce report
“STEM”*



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