High School Graduation Requirements – Science

The NJDOE requires that you pass 3 years of a lab science. This must include:

- Biology
- Chemistry or Physics or Environmental Science
- Another Lab Science*

*This third science class may not be another version of a class you have taken. AP Chemistry is too similar to Honors Chemistry to count so AP Chemistry would be an elective. Anatomy is too similar to biology to count. Your sequence must address all of the science standards. Follow a sequence on the High School flow chart or see your counselor for details.

Starting in 2017-2018, all juniors must take a state science exam. Details will be announced in classes when released by the NJDOE.

All FLHS, 5-7 credit science classes are lab sciences.

Colleges may expect you to take 4, 5 or 6 lab sciences, especially if you wish to major in S.T.E.M (Science, Technology, Engineering, and Math).

High School Graduation Requirements – Other

The NJDOE requires that you pass 1 year of a career education course. This may include courses in the Engineering & Technology Education Department, the Business Department, or some other courses.

The NJDOE also requires that you pass one half year of personal financial literacy. FLHS offers many courses in the business department that meet this requirement. The Engineering & Technology Education Department offers a course in Home Repair which is paired with Personal Finance.

Advanced Engineering & Design is available for Honors credit if you meet the pre-requisites! This counts for your career education requirement.

What should I take for my third year of science?

Special science pathways have been created for you at FLHS to assure that your studies include life, earth & physical science. Download your suggested science pathways online. As always, students are encouraged to enroll in earn credit in biology, chemistry, and physics in addition to any other science courses they may take. Classes like Anatomy, AP Biology, AP Chemistry, Horticulture, are considered electives and may not “count” as a third year of science toward graduation. These are considered science electives. Follow the pathways online.
The purpose of our courses is to help you “Learn Ingenuity.” Ingenuity is defined as the quality of being cleverly inventive or resourceful. In our courses, we will focus on teaching you ingenuity! To learn more about the program, follow this link to FLHS Academics website (Engineering & Technology).

Here is a brief overview of our courses in the Engineering and Technology Education Department:

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<td><strong>Intermediate:</strong> Innovation &amp; Invention, Technical &amp; Architectural Design</td>
<td><strong>Intermediate:</strong> Construction, Concepts &amp; Design; Home Ownership &amp; Basic Home Repair; Woods Technology 2; Woods Technology 3</td>
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<td><strong>Advanced:</strong> Advanced Engineering &amp; Design Honors; STEM Honors</td>
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### Science and Engineering & Technology Education Course Highlights

**Physical Science CP (5 Credits) – NEW 2017-2018**
An introduction to physics and chemistry which will address major concepts in each content area in broad strokes. Completion of this course in junior year would enable you to potentially enroll in a full year of chemistry in senior year, and it fulfills a graduation requirement. The course will spend approximately one semester on chemistry and one semester on physics.

**AP Physics 1 (7 Credits)** – The equivalent of a first semester college physics class which covers Newtonian Physics, work, power, energy, mechanical waves, sound and an introduction to electrical circuits. (Grade 11-12)

**Science, Technology, Engineering, Math (S.T.E.M.) H**
(1 Period - Pass/Fail)
Develop solutions to problems and design, engineer and build through the instruction of a mathematics teacher and a technology education teacher. (*Students will need to schedule a PE class during a separate period. You will not be able to overlap PE with lab.) Apply physics and mathematics. Plan...Engineer...Design. Co-requisite AP Physics B or AP Chemistry & Calculus B/C. (Grade 11-12)

**Home Ownership & Basic Home Repair** (2.5 Credits linked to Personal Finance). You will learn and apply skills to rent, purchase, and repair your home or apartment. Limited enrollment. (Grade 11-12)

**Research in Biology Honors** (3 Periods - Pass/Fail):
During this unique experience for students enrolled in AP Biology, you will be challenged to complete scientific research in molecular biology in collaboration with a local university. (*Students will need to schedule a PE class during a separate period. You will not be able to overlap PE with lab.) (Grade 11-12)

**Advanced Engineering & Design Honors (Formerly: Senior Seminar in Technology & Design H)** (5 Credits)
Are you taking Honors or AP Physics or did you complete one of these courses already? Are you interested in an engineering course? Contact Mr. Durso if you would like to enroll in this independent study class which is also open to seniors who have taken two years of technology education classes. This year, you can choose Senior Seminar in Woods, Tech & Design, or CADD! Check your course selection sheet! (Grade 12)

All course descriptions are online at www.flhs.org – click “ACADEMICS” or follow this link.

### Academic Science Grade:
Remember academic science is for students who struggle in science. It is not a course designed for you if you get bad grades in science because of lack of effort alone! If you have questions, speak to your counselor, case manager, or the supervisor.

### Physics First Students:
Did you take College Prep Physics in Grade 9? In grade 10, you should take CP Chemistry or Honors Chemistry. In grade 11, you should take CP Biology, Honors Biology or AP Biology! Check the pre-requisite sheet for guidelines.
Many changes to our **AP Science** program have occurred due to mandated changes by [The College Board](https://www.collegeboard.org). The most recent change occurred during the 2014-2015 year when **AP Physics 1** replaced AP Physics B. **AP Physics 1** is an in-depth study of Newtonian mechanics (including rotational dynamics and angular momentum); work, energy, and power; mechanical waves and sound. Electrical circuits will also be introduced. FLHS continues to offer **AP Physics C** which is a calculus based physics course which follows AP Physics 1. AP Physics 2 focuses only on fluid mechanics, thermodynamics, electricity, magnetism, optics, and nuclear physics. **AP Physics 2** may be offered at FLHS in the future.

Our **AP Science Program** is rounded out by **AP Biology** which was updated in 2011-2012, **AP Chemistry** which was updated in 2013-2014, and our new **AP Environmental Science** course which now includes an extra class period (6 days a week).

Students enrolled in **AP Biology** should consider taking **Research in Biology Honors** and students enrolled in **AP Physics, Honors Physics or AP Chemistry and Calculus** should consider taking **STEM Lab Honors**. See the course descriptions online for more details.

**AP Environmental Science** became a 7 credit science course in 2017-2018.

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### Recommended Courses

Students often come to see me, the science supervisor, to ask me, "What class should I take if I want to be a doctor?" Or they ask, "What class should I take if I want to become a research scientist?" I am happy to answer this question any time, but the answers are different depending on what science and math classes you have taken so far and how well you have done in them.

In order to help you out, a "**FLHS Science Pathways Document**" has been designed for you to follow to help you make these decisions. This, along with the "**FLHS Science Course Description Book**" should help you make an informed decision.

I strongly advise that you speak to your guidance counselor or even research entrance requirements of specific colleges on their websites. Your teachers and I are also here to help.

### Science Middle College Courses

The following science courses are now available for [FDU Middle College](https://www.fdu.edu) credit. See your teacher or counselor for more details.

- Honors Human Anatomy & Physiology
- Geo Science CP
- Astronomy CP
- Horticulture Honors or CP
Basic Information

Lab Periods & Credits
- All 5-7 credit FLHS science courses meet the definition of “lab science”.
- All science courses will provide students with opportunity to conduct inquiry based labs.
- Most science honors courses meet 6 periods a week (6 credits) to provide additional lab time.
- AP Biology, AP Chemistry, and AP Physics meet 7 periods a week (7 credits) for additional lab time.
- AP Environmental Science meets 6 periods a week (6 credits) for additional lab time.

Special Requests
If you have a special request for a science or engineering and technology education course placement, please e-mail Mr. Durso as soon as possible, preferably between January and March.

Moving Into Science Honors
- Are you currently enrolled in a CP science class and have interest in Honors or AP science for next year?
- Are you currently earning solid A’s (not A- s) in your CP science class?
- Do you have a record of success in previous CP science classes?
- Do you have a record of success on standardized tests?
- Do you have a record of success in math, English, and social studies classes?
- Do you meet the math pre-requisite for a particular honors science course?

If you answered yes to all of these questions, please make sure your CP science teacher and your guidance counselor are aware of your interest in an honors or AP class for next year; ask them to pass along your interest to me. You may also e-mail me directly (rdurso@fairlawnschools.org) so I can look into your request. Requests for movement into honors or AP classes for next year will only be entertained during the scheduling period. It is best to contact me before you complete your course selection sheet! Permission for a student to move from a CP level science course into an honors or AP science course next year rests with the school and department administration.

***SPECIAL NOTE: If you are in an academic science class, earning solid A’s, and think you would succeed in a CP science class, please contact Mr. Durso as well!

Summer School for Advancement
From time to time, students consider attending summer school math and/or science classes in order to advance into an honors or AP class. If you wish to obtain high school credit for a summer school class or wish the class to apply to pre-requisites for advancement into honors or AP classes, the class must be approved by the appropriate supervisor before you enroll. This will help you make sure that the course is similar to the courses we offer at FLHS. Speak to your guidance counselor to obtain a form.

Science & Engineering Technology Extra Curricular Activities
If these are of interest to you, contact the supervisor or student activities advisor, Merck Science Day, Science League, Governor’s School, Environmental Club, Pre-Engineering Club, & Science National Honor Society. Interested in Engineering, or other STEM fields, join the STEM League and compete in Engineering Challenges. Watch a video here.
Not Doing So Well?

Remember, the State of New Jersey requires that you **PASS** three years of lab science in order to graduate high school. Plus, there are many other graduation requirements. It would be in your best interest to pass your class the first time around! Failing a class limits the number of electives you can take or may require you to enroll in summer school.

**Opportunities for Help**
1. Ask questions in class.
2. Study with classmates (not a socializing opportunity).
3. Seek extra help after school from your teacher.
4. Request a Science National Honor Society tutor [SNHS.FLHS@gmail.com](mailto:SNHS.FLHS@gmail.com).
5. Seek a National Honor Society tutor.

**Moving Out of Honors**
It is expected that you will earn at least a **B-** in this year’s honors science course or you will not be permitted to take the following honors science course! Math and science pre-requisites also apply.

**Summer School for Make Up Credit**
If you fail a course, you may consider making up that course (ie: environmental science, biology, chemistry, earth science). Prior to enrolling in such a course, speak to your guidance counselor and the appropriate supervisor.

**Science National Honor Society**
Visit [www.flhs.org](http://www.flhs.org) for more information about the entrance requirements for membership into the SNHS chapter at FLHS.

**Contacting the Science & Technology Education Supervisor**
rdurso@fairlawnschools.org  x2409  Room D

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