Admittedly

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# Pre-Engineering Guide

## Overview

- Academic Rigor: Students applying to engineering programs (mechanical, biomedical, civil, electrical, chemical, and computer engineering, including CS which is housed under engineering at many colleges) will always get grilled on whether they can thrive in the core quantitative sequence (especially advanced calculus and physics). The first questions in AOs' minds are, "Can they handle the first-year STEM foundation (calculus, physics, and introductory engineering coursework)? Will they succeed and persist in our engineering program?"
- Extracurricular Activities: AOs want to see hands-on experience in the field of engineering or adjacent industry – could be through a competitive STEM summer program, Robotics (FIRST or YES), Girls Who Code, hackathons, etc.
- Impact: a problem-solving mindset invested in solving problems for others because it demonstrates that you know how to identify a problem and can iterate around it (debugging, learning from failure and bouncing back, constantly improving when critical feedback is shared)
- Teamwork + leadership: tech is ultimately a collaborative field (especially big tech or a startup).

## Academics

**Math Progression Matters:** A strong pathway typically looks like Honors Algebra II to Honors/AP Precalculus to Calculus (AP Calculus AB or BC, or dual enrollment with your local community college or state university). If your school offers post-AP math such as Multivariable Calculus or Linear Algebra, take advantage of it (especially if you are aiming for MIT, Carnegie Mellon, or Caltech). For students interested in engineering, Calculus is not optional at most competitive programs. If your school does not offer Calculus, speak with the Admittedly team as early as possible to discuss alternatives such as dual enrollment or approved online coursework. Engineering programs across the country expect to see Calculus in senior year at minimum, and for many of them, AP/IB/DE Physics will also be important.

- **Helpful Note:** AP Statistics can be a useful complement, particularly for students interested in business, data science, economics, or social sciences. However, it should not replace Calculus in your core math progression. For why calculus matters, check out this blog post from MIT.

**AP Physics C (Mechanics and or Electricity and Magnetism):** This is the most direct preparation for engineering majors because it is calculus-based and closely matches what you will see in first year engineering sequences. If your school offers it and you can take AP Calculus alongside, this is the gold standard.

- **Helpful Note:** If you are considering engineering, physics is especially important. When in doubt, prioritize Physics over adding another "easier" science elective such as APES.

**Computer Science Preparation:** If you have access to computer science coursework, such as AP CS Principles or AP CS A, aim for a progression that shows both fundamentals and real problem solving.

- **Helpful Note:** Evidence that you can write code, debug, and build projects, not just "learn about technology." If your school offers multiple levels, try to take at least one course that is programming heavy (often AP CS A or a dual enrollment programming class).

**Engineering Electives (if offered at your high school):** These courses help you show applied engineering skills and can make your interest feel credible, especially if your school has limited advanced STEM options. Examples that read well on applications are PLTW Principles of Engineering, Engineering Development CAD or 3D Design, Electronics, and Robotics.

- **Helpful Note:** Choose electives where you will design, build, test, and iterate along your interests and passions. Colleges respond well to courses that produce a tangible output like a prototype, CAD portfolio, or competition ready build. AOs will always prefer a level of rigor where you can succeed and thrive in, rather than a student who maximized the # of AP courses taken.

## Extracurriculars

**Technical Experience (clubs and projects colleges instantly recognize)**

**Clubs/Teams:** FIRST/VEX Robotics, TSA, Science Olympiad, MATHCOUNTS, Coding Club, Girls Who Code

**Competitions:** Hackathons (Hack Foundation), science/engineering fairs (Regeneron ISEF is the cream of the crop), AMC 10/12, AIME

**Independent Project Ideas:** Arduino/Raspberry Pi builds, apps/websites from scratch, project-based CAD + 3D work, sensors + data projects, tutoring advanced Calc/Physics with evidence that you're interested in helping those around you master concepts too.

**Key Skill Development:**

- Modeling & estimation (units, assumptions, translating words into math)
- Coding fundamentals (debugging Claude Code, GitHub, readable documentation)
- Design process (requirements, prototype, test, iterate, communicate)
- Collaboration (feedback, ownership, clear technical communication)
- Resilience (disciplined iteration)

## Recommendation Letters

- **Best:** (1) AP Calculus AB/BC Teacher + (2) AP Physics/AP Chemistry Teacher
- **Strong Optional Letters:** Robotics Coach, Research Supervisor (if they can speak to your technical ownership), PLTW Teacher, CAD/3D Design Teacher