

# AI LITERACY FOR EVERYONE FOUNDATION

## Understanding High School Engineering Pathways: Exploring Value and Options

A supportive overview designed to help students make informed,  
personalized decisions—without critique of existing programs.

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## Contents

Disclaimer .....	3
Overview of Pope's Engineering Pathway .....	3
Summary .....	3
Benefits of Completing the Full Engineering Pathway .....	4
Sacrifices and Trade-offs of the Full Pathway .....	5
Taking Engineering Courses Outside the Pathway.....	6
Do Colleges Care About the Pathway (and its Seal)? .....	7
Potential Impact on Future Opportunities .....	8
References.....	9

## Disclaimer

This document was developed to support students and families by offering a clear, neutral look at the structure, benefits, and trade-offs of *Pope High School's Engineering Pathway*. It is **not** a critique of the program, but a supplement intended to broaden awareness of how different academic choices can align with individual goals.

## Overview of Pope's Engineering Pathway

Pope High School offers an **Engineering Pathway** as part of its STEM Academy. This is a four-year sequence of Project Lead The Way (PLTW) engineering courses: **Introduction to Engineering Design, Principles of Engineering**, a specialized course (such as **Aerospace Engineering**), and a senior **Capstone (Engineering Design and Development)**. Students who complete this full sequence (typically 3–4 courses) are recognized as pathway completers, earning an **Engineering Pathway seal on their diploma** after 12th grade. In Georgia, completing a Career/Tech pathway and passing the end-of-pathway assessment qualifies students for a **CTAE Pathway Seal or Distinguished Seal** on their high school diploma. Essentially, the seal indicates the student finished a rigorous set of engineering courses and possibly earned an industry-recognized credential by passing a final exam.

The big question is: how much does this pathway (and its diploma seal) actually help with college admissions for engineering programs, and what are the trade-offs of committing to it?

## Summary

Completing the full Engineering Pathway at Pope High School can be a rewarding endeavor that strengthens her engineering knowledge and signals her commitment to STEM on college applications. It provides structured opportunities (the pathway seal, capstone, and enrichment) that can give her a slight edge and plenty to write about. However, it is not an absolute necessity for college admission into engineering programs. Colleges care that she challenged herself in relevant coursework – which the pathway certainly demonstrates – but they will not specifically demand a pathway seal. By opting out, she gains the freedom to customize her schedule, potentially taking a couple of engineering classes **on her own terms** while also pursuing other interests. Many students get into top engineering colleges without an official high school pathway, by excelling in advanced math/science classes and showing passion through electives or extracurriculars. In the end, she should choose the route that **aligns best with her interests and learning style**. If she's excited about engineering and eager for the cohesive program, the pathway could meaningfully enrich her high school experience and prep her for the future. If she prefers flexibility, she can still become a strong engineering candidate by leveraging Pope's diverse course offerings outside the structured program. The impact on her future opportunities will depend more on **what she learns and accomplishes** than on the title of "pathway completer" itself – but the pathway is a great way to learn and accomplish a lot in a focused area. It's a choice between a specialized journey or a personalized journey and either can lead to a successful engineering future for her.

Completing the full Engineering Pathway can offer **valuable educational and extracurricular benefits**. Sacrifices include a **less flexible schedule, potential conflicts with other courses, and fewer chances to pursue unrelated interests or weighted courses**. Students should consider whether the specialization is worth these costs given their personal goals and interests.

### Benefits of Completing the Full Engineering Pathway

- Strong STEM Preparation:** The PLTW curriculum is known for its hands-on, project-based approach. By taking these courses, students gain practical skills in problem-solving, design, and technology (e.g. CAD modeling, programming, and engineering labs). Admissions experts note that colleges view PLTW pathways as “*robust program(s)*” that demonstrate a student’s interest in STEM and willingness to tackle challenging material. For a prospective engineering major, finishing this sequence signals passion and *well-rounded preparation for rigorous engineering programs*. In other words, it can reassure an admissions officer that you’ve already tried engineering concepts and succeeded, which can be a positive sign.
- Capstone Project Experience:** In 12th grade, pathway students complete a capstone project (Engineering Design & Development) where they identify a real problem and design a solution. This experience is akin to a mini-thesis or invention project (). It gives students a significant accomplishment to discuss in college essays or interviews. Not many high schoolers can say they developed and presented an original engineering project to a panel of engineers, as Pope’s capstone requires (). This kind of project-based learning builds skills in research, teamwork, and presentation that colleges and future employers value.
- Recognition and Credentials:** Earning the Engineering Pathway **diploma seal** is an official recognition of specialized achievement. While the seal itself is mainly honorary, it does reflect that you completed a state-approved career/tech program. In Georgia, students who finish a CTAE pathway and pass the End-of-Pathway Assessment often gain an **industry-recognized credential** along with the diploma seal. For example, an engineering pathway might offer certification in a CAD software or another relevant skill if the exam is passed. These credentials and the seal can be listed on college applications or resumes to show extra accomplishments (even if the seal is not as universally understood as, say, an AP Scholar award).
- Enrichment Opportunities:** Being in Pope’s STEM Academy (of which the engineering pathway is a part) comes with additional enrichment. Pope specifically integrates activities like interactions with STEM professionals, field trips, STEM competitions, and outreach projects for academy students. For instance, engineering pathway students often participate in **Robotics (TSA)** and other clubs and attend events like Georgia Tech’s engineering day. These experiences can deepen learning and provide leadership or award opportunities (useful for college apps and personal development). Students in the academy have a cohort of like-minded peers and teachers, creating a community that can be motivating and fun.

- College and Scholarship Advantages:** While not a guarantee, completing a known program like PLTW Engineering can confer some advantages when applying to colleges or scholarships. Some universities partner with PLTW to offer college credit or preferred admission to students who have completed certain PLTW courses or scored well on PLTW end-of-course exams. For example, a few engineering colleges might allow you to skip an introductory course or give credit if you've taken the PLTW exam in that subject. Additionally, organizations and colleges (including WPI, University of Cincinnati, and others) have offered **scholarships specifically for PLTW graduates** in the past. Even where formal credit isn't offered, the consensus is that PLTW students are "*well-prepared and well-equipped for college and careers after high school*", which can translate to doing better once you're in an engineering program.
- Demonstrated Commitment to Engineering:** Sticking with a four-year engineering sequence shows sustained interest and growth in that field. It can help your application narrative if you're applying to an engineering school – you're basically saying, "*I've dedicated a big part of my high school career to engineering, and I loved it enough to keep going.*" This can distinguish you from applicants who only have one token engineering course or club. In competitive admissions, any authentic depth of experience helps. Pope's STEM Academy graduates have been accepted to top engineering universities such as **Georgia Tech, Purdue, and even MIT**, among others (). While many factors contribute to those admissions, the fact that these students completed the rigorous STEM program (often including the engineering pathway) shows that it can be part of a successful college prep plan.

### Sacrifices and Trade-offs of the Full Pathway

Despite its benefits, committing to the full Engineering Pathway **does come with trade-offs**. Students like her should weigh what they *gain* against what they *give up* by following this structured program:

- Reduced Schedule Flexibility:** Pope High School uses a 7-period day with six academic classes per year (one period is lunch) (). This means over four years a student has a limited number of elective slots beyond core requirements. The engineering pathway will occupy one class period almost every year (for four years) with a specific engineering elective. **That's a large portion of your elective choices.** Filling those slots with the preset engineering courses leaves **fewer opportunities to explore other subjects**. For example, if she takes Engineering each year, she might have room for only one other elective (like band, art, or an extra AP class) in her schedule annually. Students are expected to take a STEM pathway elective each year in the academy (), which can make the schedule feel tightly packed.
- Scheduling Conflicts with Other Interests:** Because the pathway has sequential courses, it can create conflicts with other courses or programs. Pope's STEM Academy FAQ notes that "*scheduling conflicts can occur where students may need to make a choice between classes*", such as between an academy class and a **Fine Arts** elective (). In practice, this means if she also loves orchestra or art, there might be years she has to choose engineering

over an advanced art class (or vice versa) because both won't fit. Some academy students resort to taking required courses like Health/PE in summer school to free up a slot during the year (). This is a sacrifice of personal time (summers) to accommodate the pathway. Not being in the pathway could relieve her from such difficult choices and extra coursework.

- Opportunity Cost – Other AP or Electives:** The engineering classes, while rigorous, are **not AP or core academic classes**. They are generally considered Career/Tech electives. Unlike AP courses or dual-enrollment classes, PLTW engineering classes typically don't carry an extra GPA weight in Cobb County (they are not labeled honors or AP in the course catalog). So, if she is aiming for valedictorian or maximizing her GPA, four years of unweighted electives might slightly disadvantage her compared to peers taking many weighted honors/AP electives. More importantly, those four class slots could have been used for other academic pursuits: for instance, an extra science course like AP Chemistry or AP Biology, or a second foreign language or advanced art. By committing to one specialty, she might **sacrifice breadth**. A student not locked into the pathway could mix and match electives – perhaps taking *two engineering courses* and *two computer science or art courses*, etc., whereas the full pathway is a narrower focus.
- Lock-In Effect:** Teenagers' interests can evolve. If she discovers after a year or two that she's not as interested in engineering as she thought, the pathway sequence might feel like a burden. In the STEM Academy, there is an expectation to carry through and complete the capstone project senior year (). Dropping out midway could mean she spent two or three years on courses that don't culminate in the recognized pathway completion (no seal, no capstone), and she might have missed out on trying something she found later (say she develops a passion for psychology or graphic design in 11th grade, but her schedule is tied up). So, there is some risk in "putting all your eggs in one basket" early in high school. A more flexible schedule could allow a student to sample and then concentrate once they're sure.
- Workload and Extracurricular Balance:** The pathway itself is rigorous. On top of that, Pope's STEM Academy **expects involvement in STEM competitions or clubs** as part of the program (). Managing engineering projects, plus possibly robotics team or TSA events, can be time-consuming. If a student also wants a high level of involvement in sports, band, or other clubs, it can be a lot to juggle. It's certainly doable (many STEM academy students successfully play sports or do fine arts) (), but it requires good time management. Opting out of the formal pathway might reduce this pressure, letting a student engage in STEM activities at their own pace. Essentially, the pathway can **intensify your focus**, which is great for depth, but the trade-off is *time* that might have been spent diversifying your profile or enjoying a lighter elective load.

### Taking Engineering Courses Outside the Pathway

It's important to know that **she doesn't have to do the full pathway to experience engineering courses**. Pope High's engineering classes (PLTW electives) are available to any student as regular electives, not only to STEM Academy members. For instance, **PLTW Introduction to Engineering Design (IED)** is open to all students in grades 9–12 with no prerequisites (). This means she could



take the intro course to gauge her interest, without committing to the whole sequence. If she enjoys it, she might take **Principles of Engineering** the next year as well – at that point she’s taken two of the three courses needed for a basic pathway. She could even choose to complete the third course and become a pathway completer informally, without having been in the official STEM Academy (though she might still need to pass the End-of-Pathway test to get the seal). In other words, **the structured STEM Academy is not the only route** to taking these classes; it’s just a more organized route.

By *opting out of the official pathway*, she gains flexibility to **mix engineering with other electives**. For example, she might decide to take IED in 10th grade, skip an engineering course in 11th to take AP Computer Science or an art class, and then perhaps take Aerospace Engineering in 12th if she still has interest. She would still graduate having taken 2-3 engineering electives—enough to show passion on her transcript—while also exploring other fields. Many students also pursue engineering interests through **extracurriculars** rather than classes. If she’s not in the pathway, she can still join the **Pope Robotics team or Technology Student Association (TSA)**, participate in science fairs, or do a summer engineering program at a local college. Colleges equally appreciate these avenues as evidence of interest. In short, not being in the formal pathway *does not bar a student from doing engineering things*; it simply removes the mandate to do it every year.

**Graduation requirements** at Pope are broad enough that she can fulfill them in different ways. Georgia requires 3 credits in either world language, CTAE, or fine arts (in any combination) plus 4 additional elective credits for a total of 7 elective credits, on top of academic cores (). Completing the engineering pathway would itself cover 3-4 of those elective credits as CTAE. But she could instead meet the requirements by taking, say, two years of Spanish and one year of art (that’s 3 credits in the world language/fine arts category), and use her remaining electives for a couple of STEM courses and perhaps an extra academic elective. **There’s no requirement that a student complete a formal pathway – it’s an opportunity, not an obligation.** So, if she opts out, she isn’t hurting her ability to graduate or to take engineering; she’s simply choosing a **non-cohort, self-designed route** through electives. This can actually let her pursue *multiple* mini-pathways: one in engineering (by taking a few classes), another in something like computer science or art, etc. The key is she would still need to plan carefully to fit what matters most to her, but she’d be **designing her own schedule** rather than following a pre-set program.

### Do Colleges Care About the Pathway (and its Seal)?

One of the central concerns is whether completing the Engineering Pathway (and earning that seal in 12th grade) gives her a substantial edge in **college admissions**, especially for engineering programs. The truth is, *colleges primarily care about the substance behind the seal, not the seal itself*. Admissions officers will see on her transcript that she took four engineering courses, including a capstone, and they will likely be impressed by that rigor and focus if she’s applying for an engineering major. As mentioned, they tend to view PLTW courses favorably as evidence of robust STEM preparation. An admissions reviewer at a technical university might interpret an Engineering Pathway completion as a sign that the student is “*well-prepared for [a] rigorous engineering program*”. In competitive programs (like Georgia Tech or MIT), many applicants will

have advanced STEM coursework; having the pathway under your belt can help show you've gone above and beyond standard science/math by doing real engineering work.

However, the **“Pathway Seal” itself is mostly a formal pat on the back**. It's a state/local recognition, not a nationally standardized award. While it will be noted on her diploma and possibly transcript, colleges won't give automatic points for a diploma seal the way they might for an AP Scholar Award or National Merit. In fact, the Georgia Department of Education describes these diploma seals (whether for career pathways, biliteracy, fine arts, etc.) as **recognition-only** – they acknowledge accomplishments but *do not confer any extra admissions advantage by themselves*. Think of it this way: the seal is like a gold star saying you completed a focused curriculum. It's certainly something she can mention in her application or essays (“Completed the Engineering Pathway at my school, earning an industry certification in the process”), which adds context to her profile. But if another student took equally rigorous courses (say AP Physics, AP Calculus, plus participated in robotics club) without the formal seal, they would be viewed just as strongly by admissions.

Colleges value **rigor, passion, and achievement**. The engineering pathway is one way to demonstrate those. Completing it shows rigor (taking advanced electives), passion (sticking with engineering through high school), and achievement (capstone project, possible certifications). But it's not the *only* way to show that. Admissions officers will also look at her **grades** in those courses and others, her standardized test scores, her overall GPA, and extracurricular accomplishments. It's important that pursuing the pathway doesn't come at the expense of her GPA or difficulty in core classes. If she can manage both, great.

If not doing the pathway allows her to get an A in AP Chemistry instead of a B in Aerospace Engineering, that might do more for her admissions chances. So, there's a balance to strike.

In summary, **colleges do respect the Engineering Pathway**, but mainly because of what it represents: a student who challenged herself in STEM. The **diploma seal** is a nice bonus but is not a magic ticket. It's the experience and knowledge gained during the pathway (and how the student leverages that in applications) that carry weight. Pope's own track record shows that pathway students get into excellent colleges (), but non-pathway students also go on to engineering programs if they have strong STEM backgrounds. Admissions committees will not penalize her for *not* having a formal pathway on her record, as long as she has otherwise taken advantage of opportunities to learn and excel in STEM.

### Potential Impact on Future Opportunities

When considering her potential college and career path in engineering, the decision to complete the pathway vs. not will not **make or break** her future, but it can shape her preparation and experiences. Here are some final insights:

- **College Success in Engineering:** One tangible impact of completing the pathway is being academically and even socially prepared for engineering coursework in college. she will enter college having done CAD design, basic circuit or mechanics projects, and a long-term design project. This could make introductory engineering classes easier for her and confirm that she's in the right major. Research has shown PLTW students often feel more confident and perform



well in STEM majors. If she skips the pathway but still takes physics, calculus, and maybe a coding class, she'll also be prepared in the fundamentals – she might just have a steeper learning curve on hands-on engineering tools that others from PLTW programs learned earlier. Either way, success in an engineering career still ultimately depends on what she does *in college*: internships, projects, etc. High school is just a foundation. The pathway might give a **stronger foundation in engineering-specific skills**, but she can acquire those skills in college if needed.

- **Career and Internship Readiness:** Through the Engineering Pathway, she could earn **industry certifications or skills** (for example, using Autodesk Inventor or programming VEX robots). These can help with landing internships or research opportunities earlier, since she won't be starting from scratch. Additionally, the network and mentorship from the STEM Academy (teachers, guest speakers, possibly local engineering contacts) might open doors — e.g., a teacher might recommend her for a summer research program because they know her capability from the capstone. If she's not in the pathway, she can still gain skills via clubs or self-study, but it requires more self-direction. On the other hand, not being tied to the pathway might allow her to, say, take a **dual-enrollment calculus at a college** or do an extra summer program, which could equally boost her readiness. There are multiple paths to the same goal.
- **Exploring Interests:** High school is also a time to explore various interests. If she is **100% set on engineering**, the full pathway makes a lot of sense to dive deep. But if she has **other interests (art, music, literature, another science)**, she should consider how to nurture those too. Sometimes, a breadth of experiences can make a student more creative in their engineering approach. Pope's STEM Academy notes that many of its students still manage to participate in fine arts or sports ( ), but it takes planning. If she opts out of the rigid pathway, she might find it easier to take unrelated electives that she enjoys, which could make her a more well-rounded individual. Colleges do appreciate well-roundedness *and* specialization – there's no one perfect profile. What matters is that she doesn't burn out or lose passion. If the pathway feels too confining, she might enjoy school less; if it excites her, she'll thrive. That personal development aspect is important for her future success.
- **Making the Decision:** Ultimately, she should weigh her enthusiasm for engineering against her desire for flexibility. If she loves the idea of being part of a focused STEM cohort and doing a big project, and she doesn't mind foregoing some other electives, the Engineering Pathway could be a **fulfilling experience with moderate admissions benefits**. If she's on the fence or wants to keep doors open, she can still achieve an impressive STEM profile by taking key courses (like physics, calculus, maybe one engineering elective) and engaging in activities, without doing all four engineering classes. **Colleges will value her application** if she shows *academic rigor* (whether through the pathway or AP/honors classes), *genuine interest* in engineering (through courses or clubs or projects), and *good performance*. Completing the pathway is one convenient package to do this, but it's not the only way.

## References

[Value of Project Lead The Way \(PLTW\) courses in college admissions? | CollegeVine](#)

College and Career Readiness: A Comparability Study of PLTW Courses

