



February 2020

8th – ACT and ACT plus Writing

Juniors – Begin your college search

Juniors – Map out dates and prepare for spring SAT and/or ACT exams

Seniors – Contact colleges to be sure your applications are complete. Send mid-year grades if required. Update colleges with any new information that might influence admission

March 2020

14th – SAT and SAT plus Writing

(register by 2/14—late registration until 3/3)

9th, 10th and 11th grade students - Make plans for a productive summer. Investigate summer programs, jobs, internships

11th grade students – Create an initial list of colleges

Prepare for spring SAT/ACT exams

School-Year Campus Visits

For many families, the college tour is a rite of passage. These visits are often determined by an applicant's school schedule, parent availability, financial resources, and family commitments. Colleges offer a wide variety of visit options – Open Houses, Diversity Days, Group Information Sessions and Campus Tours. Given these many opportunities, we'll zero in on one particular visit option, the one that you take advantage of during the school year.

Many families lean towards visits during vacation times, on the weekend, or on holidays when, typically, people are off work. These visits do not, however, come close to giving a prospective student a real look at life on a particular college campus. This is why we strongly advocate for a visit during the school year, on a regular school day. Most high schools will allow students some time off for college visits, but if that is not an option, talk to your guidance counselor about a reasonable solution.

This regular school day visit is important for the following reasons:

If school is in session, you will get a realistic idea of regular, every day student life. You'll see students walking between classes, eating in the cafeterias, sleeping on the green, studying in the library and just enjoying each other's company. Ask yourself if these scenes feel comfortable and stimulating.

During the school year, it's possible to attend a Group Information Session and participate in a campus tour with a current student. Make sure you register for these

ahead of time, typically online. Each university will show off the new science building, the updated gym, or the enlarged library on this tour. You can also look at the flyers and announcements posted all over campus and pick up the college newspaper. Prior to the walking tour, there is almost always an Information Session led by an admission professional who will give you the school's 'big picture', provide some valuable statistics, and answer general questions about the college and the admission process.

Meeting the experts is possible on a regular workday. There are three categories of 'experts' with whom you can meet during a school-year visit.

If possible, schedule a one-on-one appointment with the admission counselor who reads applications from your school. Take a short resume with you that s/he can add to your file and be prepared to ask 3-5 questions that reveal both your strong interest in that school and give you more information about your possible choice/s of major. Important – go into that conversation alone! You are the prospective student (not your parents!) and you want to show confidence and maturity. And always send a quick thank you email after your conversation. It matters!

When the student tour guides are introduced, check if any share your possible choice of major and join that tour if possible. Walk up front next to the tour guide, and ask as many questions as you want. Remember, these are students who love their school and know it well, and telling others about their college is exactly what they love to do. (continued on page 3)

Career Paths for Metallurgical Engineering Majors

- *Process Engineer*
- *Process Development Director*
- *Project Engineer*
- *Senior Design Engineer*
- *Quality Engineer*
- *Quality Manager*
- *Manufacturing Engineer*
- *Failure Analysis Engineer*
- *Integration Engineer*



Jobs in the field exist in all segments of the manufacturing economy. These include the aerospace industry, the microelectronics industry, and the biomedical industry.

Students may find themselves developing fuel-efficient transportation, processing exotic alloys for aerospace missions, improving their country's national defense technology, developing implants and biomedical sensors, or working in a team that advances electro-optical materials. With a continuing need for better efficiency in all of these areas, jobs for engineers will likely be sustained.

Majoring in Metallurgical Engineering

Did you memorize the periodic table for fun? Did you enjoy your chemistry or physics labs? Is math your thing? If so, you might consider majoring in metallurgical engineering.

Metallurgical engineering is a subset of engineering that focuses on the properties, structure, and function of metals and alloys. The major itself begins with a strong foundation in math and the sciences. These may include chemistry and physics, differential equations, calculus, and other math classes, in addition to engineering-related courses such as programming, statistics, and design.

There will also be metallurgical core courses that address the relationships between metals or alloys. Students will analyze the structures and processing of these metals in order to understand the various uses of them and how different metals and alloys can be combined.

Typically, students will take courses on both mechanical and physical properties of alloys including electrical, magnetic, and optical properties. A common requirement includes a course about the electrochemical behavior of materials.

Students come to understand these relationships on multiple levels, starting from the interactions of individual atoms and expanding to how macroscopically visible components in engineered composites interact. Other required or elective classes might include the thermodynamics of materials, the kinetic processes that control movement on a molecular scale, and the application of materials processing. Application courses could include sintering, vapor deposition of metals and alloys, and casting.

Finally, understanding the performance of metals and alloys is an important part of the major. Performance is defined by the properties of metals and alloys as well as their cost, availability, and recyclability, which are all things that must be consid-

ered in the real world of metallurgical engineering. Major programs often cover the performance aspect of metallurgical engineering in multiple courses, and then emphasize it in a large design project that is usually completed in the last year of the major.

Most metallurgical engineering departments are relatively small, which means that students get to know their faculty members and peers well. Depending on the college, classes range from ten to fifty students. Many programs have student societies that aid in a student becoming integrated into the profession before he or she graduates.

It is important to note that since this major is so complex, program concentrations differ greatly in schools across the United States. Some programs only focus on metals while others include other materials such as ceramics and composites. Also, some programs stress extractive processing of commodity metals, while others emphasize physical metallurgy and the application of engineering alloys.

Regardless of the concentration, students will leave a metallurgical engineering major with strong skills in many areas. Because the major includes more lab work than other engineering majors, students will achieve an understanding of how to use advanced experimental techniques such as X-ray diffraction, mechanical testing, and optical and electron microscopy. They will know how to analyze data, draw conclusions from quantitative analysis, think spatially, and apply their knowledge to complex problems.

The nature of the program also challenges students to think creatively. Since the world's understanding of metallurgical engineering is constantly advancing, this is a field that is always adapting. Therefore, students will leave the major equipped to make new connections that may have never been made before in the field.

Financial Matters: Understanding Net Price



Families often experience sticker shock when contemplating the cost of college, but it's the **net price**, rather than the sticker price, that prospective students need to consider. Each college publishes the **COA or Cost of Attendance** at that institution. The COA includes room, board, tuition and fees, along with an estimate for books, personal expenses, and travel to and from campus. The COA is the sticker price.

Relatively few families actually pay the full COA for their child. Instead, various grants, loans, and work study earnings all affect the actual net price of college. Let's look at the factors that affect the net price. Net price depends upon the family's individual financial situation as computed by the **FAFSA (Free Application for Federal Stu-**

dent Aid), the form required by all colleges. The FAFSA will calculate an **Expected Family Contribution, or EFC**. Your actual net price, however, may be influenced by the college's financial aid policies that determine the percentage of need they will meet, and further affected by how much the college actually wants a particular student to enroll.

Need is the difference between cost of attendance and expected family contribution. Some colleges will meet 100% of need, while others with smaller endowments meet a lower percentage of need. When a college strongly wants to enroll a particular student, they will offer **grants** to make up a larger percentage of the difference between need and COA. In addition to having excellent grades and test scores, certain applicants may be sought-after by colleges because they contribute to geographic or ethnic diversity, because they bring special abilities and aptitudes (musical, athletic, etc.), or because they have interests and skills in particular majors.

Your net price can be met in several ways. One component, the expected family contribution (EFC), might be met through the family's assets, college savings plans, and/or loans. A second way to meet your net price is through **self-help** money earned through the student's employment, and money that a student might borrow through a federal or state loan. The **GAP** is the balance needed beyond the EFC and self-help, which can be met from family assets, income, or parental loans.

Merit aid is free money provided in the form of scholarships and grants because the college is eager to enroll that student. Applicants are most likely to qualify for merit aid if their GPA and test scores place them in the top quarter of accepted students. Soon after admission decisions are released, students who applied for aid will receive notification of their financial aid package. Compare these packages to determine the **net cost** of education to your family before making a final decision as to which college to attend.

School-Year Campus Visits (continued from p.1)

Share email addresses so you can ask any further questions that come to you on the drive home.

Paying for college is a huge issue for parents and during your weekday campus visit, it is a great idea to meet with a financial aid representative, to ask your many important finance questions. Making an appointment ahead of time is usually required.

Personalizing your visit is often possible on a regular school day. You can check online or call your college's admission office and ask if a more personalized visit is an option. During

these days, you may meet with a student in your possible choice of major, attend a class, speak with a professor and for some, sleep overnight in the dorms. Some colleges offer specialized overnight programs; check the admission website for visit options.

If you have to attend one of the large open day visit programs, formulate your questions ahead of time. You'll be in the company of hundreds, and you need to really review opportunities to get your questions answered. Do the tour of course, but look for specific academic presentations, class visits, student panels and make sure you eat in

the dining hall - good food is important.

Talk to students! Whichever visit program you are able to attend, seek out students. You'll see them in the library, the dining hall, walking around campus and chatting with their friends. Summon up all your courage and tap some on the shoulder – ask them if they are happy and why, where else did they apply, why did they choose this particular school, and ask them about their living environment. These first-hand conversations can make or break your impressions of your possible new academic home far more than the weather on the day of your visit!



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“Elite” Summer Programs

Many students have probably been impressed with the fancy mailings they’ve been receiving notifying them that “You’ve been nominated” or “Congratulations, you’ve been identified as a strong candidate for our selective summer program.”

Hopefully, your scam antenna is up. You are probably asking yourself why so much money is being spent on these fancy envelopes, the personalization, the multitude of enclosures, etc. Yes, you’re right, it is a marketing ploy. We often wish we could convince these companies to reduce their marketing costs and then cut the fees for these programs.

Many of the programs are solid. Students may have great experiences, learn a lot, and enjoy being in an academic environment on a college campus away from their families - those are all points in their favor. The downside is that they are very pricey, hence elite, and are typically not very selective at all. We refer to many of them as “pay-to-play” programs. They carry little or no weight in the college admission process.

The companies and the colleges behind such programs have typically created for-profit enterprises to benefit their company or college, even if they are offered at or by a non-profit institution. Often, they run elaborate marketing campaigns that make the programs look as if they are incredibly selective. That is usually not the case.

The big question is, “Will these programs help get you into college?”

Colleges may be happy to see these programs on a student’s resume because they may indicate the student has intellectual/personal interests and commitment, but they also generally indicate that the student is from an upper-middle-class background and can afford a \$3000-\$10,000+ summer experience.

So, if the biggest reason you’re considering attending one of these programs is because you think it will seal the deal to gain acceptance at your dream college, think again. These programs won’t hurt you, and if your family can afford it, they can provide great learning experiences and exposure to professors and other motivated students.

Another motivation to attend might be to “test-drive” a college campus or a city to see if it represents a good fit; if that’s the case, then these programs can be incredibly valuable on a variety of levels. You may have assumed you wanted the hustle-bustle of a city, but the reality of noisy streets and a more impersonal campus and student body may not jibe with what you anticipated for your college experience. How wonderful to learn that now, while you’re still in high school, instead of finding that out freshman year!