



## **If you're Thinking of Studying Engineering. . .**

Students fresh out of school with Engineering degrees are among the most employable graduates these days. If you love to solve mechanical problems, tinker, rebuild and repair things, or maybe have done some computer programming of your own or developed your own computer App, there are a variety of schools with programs that might be for you. Be advised, though, you need to apply to Engineering programs directly from high school. This course of study has so many requirements that must be taken in the proper sequence, that it doesn't give you the luxury of waiting until the end of your sophomore year to declare it as your major the way you can most other majors at most schools.

Also, be advised that Engineering is notoriously difficult and a recent study reported that 40 percent of Engineering majors leave the program or fail to graduate, twice as many as students in all other majors. In some cases this is because they arrive with inadequate preparation and become discouraged by the grade deflation that may result from strong curves. In other cases it's because they find their workload is substantially greater than that of other students in their midst and they feel deprived of the opportunities they see their non-Engineering peers experiencing.

To combat this last problem, Rutgers recently created living-learning communities that house their Engineering students together so they can provide emotional as well as academic support for each other, and the result has been a threefold to fourfold increase in retention.

As for the required high school preparation, students considering highly ranked Engineering schools should take Advanced Placement BC Calculus (as opposed to AB Calculus) and should take Advanced Placement courses in physics and another lab science too. If their school won't allow them to take both A.P. Calculus and A.P. Physics, they should take A.P. Calculus. If they can take an A.P. course that requires writing too, so much the better because admissions officers are increasingly concerned about their ability to write.

Engineering programs can be fiercely competitive to gain entrance to, so the median numbers for students admitted to them are frequently ten to twenty percent higher than the published median numbers for the freshman class as a whole. For highly ranked programs, applicants

should take SAT subject tests in Math 2 and one or more science. It sometimes helps to take additional subject tests beyond the number the schools say they require, and applicants are strongly advised to write about why they love Engineering even if a school's application doesn't ask the question specifically.

When putting together the college list, some questions to consider are whether you want a four or a five year program and how many actual hands-on work experiences you want built into the program. Four year programs typically incorporate one internship or co-op, while five year programs typically incorporate three. Since the internships and co-ops usually pay, the five year programs may not cost any more than the four year ones.

Programs also differ in when they require students to declare the specific type of Engineering they will pursue, with some schools requiring it right from the beginning and others allowing students to explore a variety of options before they have to select the one they'll focus on.

Some schools have a more competitive structure where all the grading is curved, in essence pitting the students against one another, whereas others foster a more collaborative environment. Often the liberal arts schools are the ones with the more collaborative approach, but it is always wise to inquire about each school specifically.

Also, schools differ in how early in the students' careers they begin hands-on work on projects and how much money is allocated for students to participate in national competitions, so, once again, don't make assumptions without asking specific questions.

Finally, be aware that some schools have linked programs which enable students to take two years of study at one place and then transfer automatically to an Engineering program at another institution for three more years. Other linked programs enable students to do three years of work at the first institution before switching automatically to a second institution for two more years. Unfortunately there is no published list of these 3+2 or 2+3 programs, but they are described on various college websites, so you might want to keep your eyes out for them.

A list of all accredited engineering programs in the U.S., complete with the degrees conferred in each type of engineering, may be found at the following link:

<http://main.abet.org/aps/Accreditedprogramsearch.aspx>.