What should I do *NOW* to prepare for engineering?

While in high school you should take:

- Algebra I & II
- Trigonometry
- Biology
- Physics
- Social Studies
- Fine Arts/Humanities
- Computer Programming/Applications
- Geometry
- Calculus
- Chemistry
- English
- Foreign Languages

For engineering, Advanced Placement or Honors level courses are recommended. Combined scores of 1100 (SAT) or 20 (ACT) should be your goal.

Colleges seek "well-rounded" students...Extracurricular activities, particularly those involving math and science at the junior high and high school level. Part-time or summer jobs also help give you the experience that colleges are looking for.

Essentially, the sooner you start planning for your engineering career, the better off you will be.

Source:
http://www.eweek.org/site/Students/eandyou.shtml

Famous Women in Engineering:

Grace Murray Hopper– Have you ever used a computer in your life? Well then you've directly benefited from Grace Hopper. She designed the first compiler, a computer program that is used as the basis of all other computer programs. She led her peers into the computing world and we are all benefiting from it.

Lillian Gilbreth– Have you seen the movie *Cheaper by the Dozen?* This movie was inspired by a famous Industrial Engineer known for pioneering the field of increased efficiency and production through budgeting of time, energy, and money. With all those kids, can you blame her?

Julia Morgan– Have you ever been to Hearst Castle in California? That entire complex was engineered and architected by another famous woman architect and engineer, Julia Morgan. Not only did she design and build the gorgeous Hearst Castle, she is also responsible for saving many lives through her understanding of structurally sound and "earthquake proof" buildings.

For More Information:

Engineering Week
http://eweek.org

Engineering Girl Website
http://www.engineergirl.org

Discover Engineering Website
http://www.discoverengineering.org

Society of Women Engineers
http://swe.org

To contact the Cal Poly SWE student section:
California Polytechnic State University
Student Life & Activities, Box 162
San Luis Obispo, CA 93407

Phone: 805.756.2417
Fax: 805.756.5450
Website: http://www.swe.calpoly.edu

ENGINEERING
The Stealth Profession

Engineering has been called the stealth profession because most people have no idea what engineers do. This is unfortunate, because almost everything in society is linked to engineering.

- What exactly is engineering?
- I still don't really understand what engineering is, how do I know if it's right for me?
- Engineering chocolate: a practical application
- How do I get into engineering?
- A few famous women in technology
- More information about engineering

Presented by the
Society of Women Engineers
Cal Poly San Luis Obispo,
Student Section

WHAT IS ENGINEERING?

Engineering is the art of applying scientific and mathematical principles, experience, judgment, and common sense to create objects that benefit people. Engineers
design bridges and important medical equipment as well as processes for cleaning up toxic spills and systems for mass transit. In other words, engineering is the process of producing a technical product or system to meet a specific need.

Engineers are problem solvers, people who search for quicker, better, less expensive ways to use the forces and materials of nature to meet difficult challenges. Throughout the ages, from the building of the Egyptian pyramids to the landing on the moon, engineers have been the shapers of progress.

Source: http://www.asee.org/precollege/engineering.cfm#whatiseng

How Do I know If Engineering Is Right for me?

- Do you get good grades in math and science?
- Do you enjoy knowing how things work?
- Do you ever think of new or better ways to do things?
- Are you interested in technology?
- Do you like to do mazes and jigsaw puzzles?
- Do you usually make sound decisions, and do people trust your judgment?
- Can you express yourself easily and clearly?
- Do you work well with others?
- Do you want to help people and the world?

If you answered "yes" to most of these questions, you might want to consider pursuing engineering.

Source: http://www.asee.org/precollege/assess.cf

Chocolate Engineering:

What does engineering have to do with chocolate?
Engineers are critical in all phases of candy making - everything from developing products to delivering them to the stores. A team of people from all the major areas of production are involved whenever a new product is introduced, and engineers are important members of this team. A team including several engineers recently produced Celebrations® Chocolates, 8 varieties of miniature chocolate bars in a gift box.

A Sweet New Gift!

Whenever a new candy bar is developed engineers ask: How can it be kept fresh and wholesome from the time it is made until you purchase and eat it? The taste and texture of a candy bar with separate layers of nougat, caramel, and chocolate can change when ingredients in different layers mix with one another. This is the kind of challenge Chemical Engineers might work on during product development. In the case of Celebrations® Chocolates, the engineers were faced with the challenge of making familiar candy bars in a new miniature (only an inch long!) size.

From Test Kitchen to Mass Production

There is an art to candy making. If you were to make a candy bar at home, you'd need a sense of the temper (the amount of crystallization) of the chocolate to get just the right consistency and texture. In a candy factory, that sense must be replaced by a scientific process that uses sensors and meters to measure the amount and size of the crystals in the chocolate. Process Engineers take a product made in small batches in a test kitchen and develop the means to produce it on a large scale. Once the team had developed a way to make the candy bars small, they had to figure out how to make LOTS of them.

From Conveyor Belt to Convenience Store Shelves

Putting the actual candy bar into its own package presents different problems. Mechanical Engineers design systems that take fragile food items, like candy bars, place them in packaging, and move them around a processing plant at high rates of speed without damage. Sometimes this is a real challenge: how do you get the right number of each candy into a box of assorted chocolates?

The Chocolate Factory

A well managed food plant starts with a well designed building. Civil Engineers design and construct the building that houses candy-making equipment. In food manufacturing plants, it is especially important that products be produced in a safe and clean environment, meeting all rules and guidelines. The actual equipment needed for the process is often designed by chemical and mechanical engineers. For Celebrations®, the team took existing space, redesigned original equipment, and installed additional required equipment.

Counting Confections. . .

Imagine designing a computer control system that can track 10,000 pieces of candy per minute! Working with advanced sensor technologies, Computer Engineers and Electrical Engineers are developing smart control systems to monitor and manage the production of candy bars. Artificial intelligence and fuzzy logic are also being applied to control complex processing systems.

Keeping it Clean

Air and water coming into the plant must be clean to protect the candy, and air and water leaving the plant must be clean to protect the environment. Environmental Engineers develop the water management and air handling for manufacturing plants. They are also responsible for handling discharge permits and oversee government reports that show environmental compliance.

Making it Better

Engineers are best suited to evaluate equipment downtime and repairs, and to direct maintenance crews. Continuous improvement of processes is also important, and Industrial Engineers analyze operations and make recommendations for making the candy bars faster, at higher quality, and for less money.

To be an engineer in the candy making industry is much like being the conductor of a great orchestra. The conductor of the production team must allocate resources and provide the problem solving skills. You can make your life a little sweeter with a tasty career in food processing engineering.

Source: http://www.engineergirl.org/nae/cwe/egcars.nsf/weblinks/