



TOPIC: Computer Engineering

In this issue, you'll find the tools to help your students explore...assess...and experience engineering! From a look into the world of Tessa Cooper, a Computer Science engineer and her work designing virtual environments to enjoying a hands-on activity where students explore a software tool that enables them to quickly begin building their own video games. Students will recognize first-hand how engineering is all around them. Enjoy!

EXPLORE...

Find your dream job, meet extreme engineers, watch videos

What Do Engineers Do?

Computer engineers make a difference in the world by...

- Developing distance learning programs for rural communities.
- Creating software to detect brain tumors.
- Designing a paper-thin laptop.
- Creating a computer model of how the human brain learns and processes information.

Computer engineers are vitally important in almost everything that we do. Computer engineers develop cutting-edge video software, come up with a better phone to text friends, or invent a new hand-held device. In the medical field, computer engineers create programs that track patient records, control X-ray and MRI machines, and offer surgeons visual maps of the operations they are performing. Opportunities abound as a computer engineer, from medicine to national security, from education to entertainment.

Salary

The average starting Salary for a Computer Engineer (2007):

<i>B.S. degree</i>	<i>M.S. degree</i>	<i>Ph.D.</i>
\$56,201	\$60,000	\$92,500

Extreme Engineer: Tessa Cooper

What She Does

Tessa Cooper is currently a graduate student in [Computer Science](#) at Ohio University where she works to design virtual environments and synthetic worlds for use in educational facilities through the [STEAM](#) (Science and Technology Enrichment for Appalachian Middle-schoolers) program. Tessa's work with STEAM is truly a unique collaboration of computer scientists, artists and educators working together under a unified vision of the future — one that encourages students and teachers of all ages to utilize technology.

To see Tessa's latest game, go to: <http://vital.cs.ohiou.edu/nutritiongame.html>

Making a Difference

Tessa's feels that her work with STEAM helps kids in grades six through eight engage in more effective learning by helping to develop higher-order thinking skills. It's through project STEAM that Tessa develops lesson plans and interacts with students in a classroom environment. The STEAM project aims to broaden graduate education for engineering students at Ohio University while also improving learning in science courses for middle school students at surrounding schools.

Why Engineering?

Engineering was the farthest thing from Tessa's mind "I always thought I would be a journalist" Cooper said, "but my dad (an engineer) was convinced that I would be interested in programming." While in college she decided to take a programming class and knew right away that she wanted to change her major. "Everything around us has been touched by engineering" Tessa said, and really loves that there are so many possibilities to choose from in the field. Cooper also likes the travel she gets to do occasionally to showcase her many interactive achievements.

Advice

"Take lots of math and science classes while in high school" Tessa advises. She also recommends getting involved with programs that are offered in your local area. There are often programs and competitions held at colleges or universities or engineering companies may sponsor events during Engineers Week.

Hobbies/Free Time

Tessa has many hobbies to include snowboarding, playing the guitar and reading lots of good science fiction books. But most of her free time is now spent on her thesis that is a project to help improve the lives of people with type I diabetes through the development of interactive programs.

Education

Tessa is a 2007 graduate of Ohio University's Russ College of Engineering and Technology with a Bachelor of Science in computer sciences. Pre-college, Tessa attended Gahanna High School in Columbus, Ohio.

ASSESS...

Find your strengths, prepare for the future

PathAssess NOW Available!

PathAssess is an online tool aligning students' interests with careers in engineering. Students answer a series of questions and receive a customized profile relating their interests to engineering careers they may wish to pursue. Go to www.jets.org/assess to learn more.

EXPERIENCE...

Get active and unlock the mysteries of engineering

Hand-On Activity



Alice 2.0 — Learn to Program Interactive 3D Graphics

Grade Level: High School

Group Size: Variable

Time Required: Variable

This month's topic for the Pre-Engineering Times is Gaming Technology. The first step for students to move into gaming technology and software engineering in general is to learn to program. In the past, learning to program meant beginning with a text based programming language where students had to learn a myriad of basic text commands before they could see an output. This month's activity is actually a software tool that enables students to quickly begin building their own video games.

[Alice 2.0](#) is an object-oriented and user friendly programming language. This programming language addresses both the mechanical and sociological barriers that currently prevent many students from successfully learning to program a computer. Alice addresses the mechanical barriers to programming by making it much easier for students to create programs. Rather than having to correctly type commands according to obscure rules of syntax, students drag-and-drop words in a direct manipulation interface. This user interface ensures that programs are always well-formed. In addition, Alice reifies object-based programming by providing animated, on-screen 3D virtual objects.

The focus of the [Alice project](#) is now to provide the best possible first exposure to programming for students ranging from middle schoolers to college students. Alice v2.0 is the next major version of the Alice 3D Authoring system, from the Stage3 Research Group at Carnegie Mellon University. It has been completely rewritten from scratch over the past few years.

The [Engineering Pathway](#) Portal to the National Science Digital Library (NSDL) brings together quality engineering education materials for from all over the internet allowing teachers to search all of these documents in a single location. Each month during the year in the Pre-Engineering Times, the Engineering Pathway highlights one or more engineering activities available on the collection related to the month's theme.

JETS Challenge



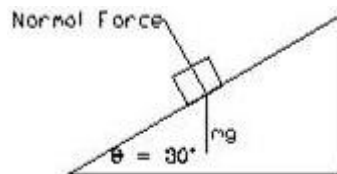
Each Friday JETS posts a new challenge question. Use these challenges to warm up for TEAMS or NEDC competition, in your classroom for extra credit, or at an engineering club meeting.

This Week's Challenge:

Challenge 118 — Simple Friction

[Click here to download a printable version.](#)

A block of wood is sitting on a inclined plane. The block of wood has a mass of 10 kg and its height is 2m. The plane is inclined at 30 degrees and is frictionless.



The Challenge: How long will it take for the block to reach the bottom? What is the normal force of the block?

Submitting Answers to JETS

E-mail your answer to JETS at challenge@jets.org and enter 'Challenge xx' in the subject line. NOTE: Only those submissions with 'Challenge 84' (enter the actual week's challenge number) in the subject line will be considered for the monthly drawing.

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