Iowa State University

OF SCIENCE AND TECHNOLOGY

Program for Women in Science and Engineering

Fall 2022 Go Further (Nov 01, 2022)

Registration Period: Aug 29, 2022 - Oct 21, 2022

(Session 1) 9:50 AM - 10:35 AM

Tag	Presentation	Materials	Description
A	*The Boeing Egg Mission		Come join us on a mission to transport your passenger (aka an egg) safely to their destination. This mission simulates what it takes to design, assemble and deliver a product to your customer; similar to how Boeing designs, assembles and delivers airplanes to numerous airlines around the world.
B	Nylon Rope Trick (Polymer Synthesis)		The Nylon Rope trick shows interfacial step growth polymerization. In the demonstration a water soluble diamine interacting with a non-water soluble diacid chloride by producing a filmÂ at the water organic interface. This polymer film is flexible and canÂ be pulled out and spun around a rod to form a cautiously growing nylon rope,Â which contuse the step growth polymerization as the film is cautiously removed until one of the reactants is used to completion.
C	Emerging Diseases Detectives		Students will learn how scientists track and study disease outbreaks. They will be provided a short overview of epidemiology and public health before completing a tabletop scenario that will allow them to be disease detectives.
D	*Why Do Gushers Gush, Pop Rocks Pop, and Cheetos Puff?		This session will introduce food science and includes brainstorming, tasting, and discussion on how Gushers, Pop Rocks, and Cheetos are made. Have you wondered how other foods are made or have questions about food? Bring your questions along!
E	Exploring the Quantum world with Quantum Tic-Tac-Toe		What is quantum physics? In this session, participants will learn about quantum physics ideas such as superposition, entanglement, and measurement. Participants will play a game called Quantum TiqTaqToe" via a mobile device and interact with other participants.
F	Metal Casting: Transform Metal into Merchandise		In this interactive workshop, you'll learn about different casting methods and see a valve cast right before your eyes. We'll also show you how valves work by helping you assemble a 3D printed valve yourself.
G	Molecular spaghetti: from gummy bears to body armor		Ever wonder what polymers are? This session will focus on one of the three main classes of materials: polymers - long-chain molecules that can be designed for many purposes, their applications spanning from food industry to surgical implants to structural parts. You will experience hands-on demonstrations of various polymer-based materials and will be able to answer questions such as: Can you identify polymers that you see every day? How can you make something waterproof? What happens when a polymer freezes? Join us in exploring this unique class of materials and its many applications.

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H	Collins Aerospace: Explore Engineering		" Want to learn about what engineers at Collins Aerospace do? Get a highlight of how industrial, software, and mechanical engineers think through hands on activities around lean manufacturing, computer science, and 3D printing/rapid prototyping. Collins is using innovative solutions to keep pilots and passengers safe, connected, and informed."
I	Civil Engineering and the World Around You		Learn about what it means to be a Civil Engineer from members of the American Society of Civil Engineering club. Then YOU get a chance to try out Civil Engineering! In small groups, students will design and build the tallest tower using toothpicks and marshmallows. A winner will be announced at the end.
J	*Be the Predator – Playing with Research Data		Through an interactive game, you get to be both predator and scientist. You'll directly affect a virtual population by "eating" your prey, then explore the results of your meddling through real-time data collection and analysis.
K	*Creating a Pet Shop using Lists and Loop		After taking this course, you will be able to create your own custom pet shop using HTML, JavaScript, and CSS.
L	*Wondrous Woodchips		Woodchip bioreactors are used to clean nitrates from agricultural run-off water. In this session, students will make predictions using data and explore their hypotheses using lab-scale bioreactors. ISU researchers will also lead tours of state-of-the-art water quality labs.
O	Smelling Parkinson's		Joy Milne of Perth, UK, claims she is able to smell whether or not someone has Parkinson's Disease. We will be doing a hands-on activity and statistical simulation to discover if Joy really can smell Parkinson's Disease.

(Session 2) 10:40 AM - 11:25 AM

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C	Stop Aquatic Hitchhikers: Working with Aquatic Invasive Species		We will be presenting a variety of demonstrations about materials and their properties as well as the experiences of materials engineers
D	*Why Do Gushers Gush, Pop Rocks Pop, and Cheetos Puff?		This session will introduce food science and includes brainstorming, tasting, and discussion on how Gushers, Pop Rocks, and Cheetos are made. Have you wondered how other foods are made or have questions about food? Bring your questions along!

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E	Come dine with microbes: the science and species behind fermentation		In this session, students will learn about the microbes that grow on our food: both those who are helpful (for things like fermentation) and those who are harmful (those who spoil food or cause illness). Students will get to set up a vegetable fermentation during the session, which they can bring home to monitor and eventually eat!
F	Metal Casting: Transform Metal into Merchandise		In this interactive workshop, you'll learn about different casting methods and see a valve cast right before your eyes. We'll also show you how valves work by helping you assemble a 3D printed valve yourself.
G	Molecular spaghetti: from gummy bears to body armor		Ever wonder what polymers are? This session will focus on one of the three main classes of materials: polymers - long-chain molecules that can be designed for many purposes, their applications spanning from food industry to surgical implants to structural parts. You will experience hands-on demonstrations of various polymer-based materials and will be able to answer questions such as: Can you identify polymers that you see every day? How can you make something waterproof? What happens when a polymer freezes? Join us in exploring this unique class of materials and its many applications.
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(Session 3) 12:20 PM - 1:05 PM

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C	Modular Arithmetic with Bean Bag Tossing		What do you know about modular arithmetic? You might say I don't know what means? You are not alone. After this session, you'll see just how much math plays into our every day lives through a fun interactive hands on bean bag activity that demonstrates modular arithmetic.

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E	Clock Reaction		"When two colorless liquids are mixed, after a few moments, the colorless liquid will change into a dark blue color. In this case, there are several chemical reactions occurring to make this "clock reaction"• happen. In this session, students will learn about how chemical reactions can be sped up or slowed down and be introduced to the scientific process. "
F	Electrifying Energy		Come learn about different careers in the utility industry, how electricity is produced and transmitted and participate in a fun energy activity!
G	Create, Connect, Change		Hands on Engineering Session
H	Weather, Climate and Meteorology		This session gives a brief overview of all the types of weather. What can you do with a meteorology degree, and weather trivia.
I	*Lego Masters Process Improvement		No matter what profession you choose, there will always be processes in need of improvement. In this session you will learn the principles of process improvement while having fun with Legos.
J	*Discovering Agronomy - the world of plants and soils		Learn to extract DNA from plants and see how we use DNA in our labs to identify genes and biological networks that control important traits such as disease and stress tolerance. Also, get your hands dirty determining soil texture including sand, silt and clay in the soil! We'll find out if they respond the same when wet and what can cause soil runoff which can impact water quality in the area.
K	*Glassblowing Demo		Have you ever wanted to look into a volcano? The glass furnace in the glassblowing studio is as close as you can find in Iowa. Watch molten glass transformed into artistic and functional objects. Gain an appreciation of the intersection of science and art. Check out a student organization that you may join as an ISU student!
L	*Structure Design and Build		Teams of 5-7 are given a set time to replicate structures. Students will simulate the building construction process by engaging in communications between the building owner, the project manager, and the construction team. The owner will communicate their vision and see it come to life by the construction team. Will you be able to bring the owner's vision to life?
M	*Critters are Cool!		I will be bringing my pet reptiles and invertebrates in for an interactive informational session on how their background and biology plays a role in their husbandry. In a way, they are an example of how science and the natural world functions.

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N	*Material Science with Ceramics, Metals & Polymers		Our session will show the three biggest materials in the engineering field: Ceramics, Metals & Polymers. We will demonstrate the amazing strength and brittleness of ceramics, the different treatments we can apply to metals to change their properties, and demonstrate the changes polymers can exhibit through temperature change. We will present why these materials act this way as well as allow students to get hands-on experience with them.

(Session 4) 1:10 PM - 1:55 PM

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C	The Phases of Chocolate		Students will learn about phase diagrams and how cooling rates, annealing and changes in composition can affect the quality of materials. After learning some material science theories related to chocolate, the students will be given some melted chocolate and will be presented with different options for cooling their chocolate with the goal of getting the best quality chocolate that can solidify within the time-frame of the session. This theory and activity will be connected to phase diagrams and solidification of engineering materials.
D	Where's the Beef?		There are many options for protein on the market today. This presentation will explore the differences between plant-based protein vs beef. We will also discuss different careers in the meat animal industry.
E	Attraction in Science! Harnessing the Power of Magnets for Cars, Trains, and Roller Coasters		Did you know some people use magnets to go from one place to another? Join us to learn about how magnets can help with transportation needs in your community and in the future. Attendees will conduct experiments with magnets and make observations on how magnets interact.
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