



UNIVERSITY OF
TORONTO

Engineering



IN-SCHOOL WORKSHOPS

Science, technology, engineering & math workshops for grades 3 to 8

MAY 11 – JUNE 12, 2015

IN-SCHOOL WORKSHOPS

As a teacher, you can appreciate the challenge that comes with finding exciting new ways to teach science to your students. Our In-School Workshops bring the excitement of science, technology, engineering and math (STEM) into your classroom in a way that complements and expands upon the Ontario curriculum. We aim to inspire youth to think about science and engineering in new and creative ways.

Our philosophy is simple: children learn best through active engagement. Our In-School Workshops do just that—we weave STEM concepts into discovery-based activities, making learning both fun and memorable.

All workshops have been carefully developed to ensure that activities draw clear connections to the Ontario curriculum.

QUESTIONS?

Call 416-978-3872
or email us at
workshop@ecf.utoronto.ca.



IN-SCHOOL WORKSHOPS

Science, technology, engineering & math workshops for grades 3 to 8

We link our workshops to Ontario curriculum expectations and are pleased to offer the following workshops to grade 3 to 8 classes. For pricing and booking instructions, please see the back cover. Each workshop can accommodate a maximum of 30 students and is offered at your school or at the University of Toronto's St. George campus. Workshops for 2015 are offered between May 11 and June 12. Our workshops can be customized for different grades — please contact us with specific requests.

UNDERSTANDING LIFE SYSTEMS

WORKSHOP	ACTIVITY DESCRIPTION	GRADE	TOPICS	ONTARIO CURRICULUM CONNECTION	UNIVERSITY DISCIPLINE CONNECTION
Creature Creation (LS-1)	Students will design and construct a unique creature using principles of adaptation for survival in specific environments and ecosystems.	Gr. 3	Structural adaptations that allow animals to survive in specific habitats; impact of the environment on specialized and generalized species	Understanding Life Systems: Habitats and Communities	Biology / Bioengineering
		Gr. 6	Characteristics of organisms; classification systems; biodiversity and its role in maintaining the resilience of species	Understanding Life Systems: Biodiversity	Biology / Bioengineering
Gene Machine (LS-2)	Students will extract DNA from plant cells through chemical processes and explore the structure and importance of cells.	Gr. 6	Distinguishing characteristics of plants and animals; role of biodiversity; cell theory; DNA; principles of heredity	Understanding Life Systems: Biodiversity	Biology / Bioengineering
		Gr. 8	Cell theory; structures and organelles in cells; characteristics, structure and function of plant and animal cells; DNA; principles of heredity	Understanding Life Systems: Cells	Biology / Bioengineering

UNDERSTANDING STRUCTURES & MECHANISMS

WORKSHOP	ACTIVITY DESCRIPTION	GRADE	TOPICS	ONTARIO CURRICULUM CONNECTION	UNIVERSITY DISCIPLINE CONNECTION
Crazy Cranes (SM-1)	Students will design and construct a hydraulic crane as a working mechanical system.	Gr. 5	Technological problem-solving skills to design, build and test a structure and mechanical system that performs a specific function; the advantages and disadvantages of different types of mechanical systems	Understanding Structures and Mechanisms: Forces Acting on Structures and Mechanisms	Mechanical Engineering
		Gr. 8	Technological problem-solving skills to investigate a system that performs a function; relationship between work, force and distance; mechanical advantage	Understanding Structures and Mechanisms: Systems in Action	Mechanical Engineering
Beams and Bridges (SM-2)	Students will design, build and test bridges to withstand an applied load.	Gr. 3	Factors that impact the strength of a structure and its ability to support a load; materials and construction techniques to add strength to structures; vocabulary, including compression, tension, strength and stability; problem-solving skills in designing, building and testing a strong and stable structure that serves a purpose	Understanding Structures and Mechanisms: Strong and Stable Structures	Civil Engineering
		Gr. 5	Internal forces acting on a structure (compression, tension); external forces (weight, wind, movement); materials and construction in bridge design; building a stable structure to support a load; how structures are built to withstand forces	Understanding Structures and Mechanisms: Forces Acting on Structures and Mechanisms	Civil Engineering
Buildings and Towers (SM-3)	Students will design and build structures using playing cards and laser-cut clips called Skallops.	Gr. 3	Factors that impact the strength of a structure and its ability to support and resist loads; materials and construction techniques that add strength and stability to structures; problem-solving skills in designing, building and testing structures; incorporation of real-world examples	Understanding Structures and Mechanisms: Strong and Stable Structures	Civil Engineering
		Gr. 7	Social, economic and environmental factors that influence the way structures are designed and built; the relationship between structural design elements and the forces that act on them; comparison of different forms and how they support or withstand loads; problem-solving skills in building three-dimensional structures based on engineering drawings	Understanding Structures and Mechanisms: Form and Function	Civil Engineering

UNDERSTANDING STRUCTURES & MECHANISMS

WORKSHOP	ACTIVITY DESCRIPTION	GRADE	TOPICS	ONTARIO CURRICULUM CONNECTION	UNIVERSITY DISCIPLINE CONNECTION
Chain Reactions (SM-4)	Students will design, build and test a Rube Goldberg Machine using simple machines.	Gr. 3	Impact of pulley-and-gear systems on daily life; technological problem-solving skills to design, build and test a pulley or gear system; rotary motion in a system or its components	Understanding Structures and Mechanisms: Pulleys and Gears	Physics
		Gr. 8	Technological problem-solving skills to investigate a system that performs a function; relationship between work, force and distance; purpose, inputs and outputs of a system	Understanding Structures and Mechanisms: Systems in Action	Physics
Indy 500 (SM-5)	Students will design, build and test a model race car.	Gr. 5	Technological problem-solving skills to design, build and test a structure; external forces acting on a structure; design, build and test integrating principles of aerodynamics; evolution and change in systems	Understanding Structures and Mechanisms: Forces Acting on Structures and Mechanisms	Aerospace Engineering
		Gr. 6	Applications of the properties of air; different forces (thrust, drag, lift, weight); design, build and test integrating principles of aerodynamics	Understanding Structures and Mechanisms: Flight	Aerospace Engineering

UNDERSTANDING MATTER & ENERGY

WORKSHOP	ACTIVITY DESCRIPTION	GRADE	TOPICS	ONTARIO CURRICULUM CONNECTION	UNIVERSITY DISCIPLINE CONNECTION
Alarm Systems (ME-1)	Students will create working alarm systems using circuit components.	Gr. 3	Properties of light; properties of sound; technological problem-solving skills to design, build and test a device that makes use of the properties of light or sound	Understanding Matter and Energy: Light and Sound	Electrical Engineering
		Gr. 6	Series and parallel circuits; circuit components; design, build and test an alarm system that transforms electrical energy into another form of energy to perform a function; conductors and insulators of electricity	Understanding Matter and Energy: Electricity and Electrical Devices	Electrical Engineering
Forensic Fun (ME-2)	Students will use knowledge of chemical interactions to solve a mystery.	Gr. 5	Use of scientific experimentation skills to investigate changes of state and matter; identify properties of solids, liquids and gases	Understanding Matter and Energy: Properties and Changes in Matter	Chemical Engineering
		Gr. 7	Properties of pure substances and mixtures; particle theory of matter; experimentation skills to investigate the properties of mixtures and solutions	Understanding Matter and Energy: Pure Substances and Mixtures	Chemical Engineering
Slime and Polymer Engineering (ME-3)	Students will formulate and synthesize polymer creations.	Gr. 5	Physical properties of materials and their applications; properties of solids, liquids and gases; physical and chemical changes	Understanding Matter and Energy: Properties and Changes in Matter	Chemistry / Chemical Engineering
		Gr. 7	Properties of pure substances and mixtures; particle theory of matter; experimentation skills to investigate the properties of mixtures and solutions; concentration of solutions in qualitative and quantitative terms	Understanding Matter and Energy: Pure Substances and Mixtures	Chemistry / Chemical Engineering

UNDERSTANDING SPACE & EARTH SYSTEMS

WORKSHOP	ACTIVITY DESCRIPTION	GRADE	TOPICS	ONTARIO CURRICULUM CONNECTION	UNIVERSITY DISCIPLINE CONNECTION
Extreme Roller Coasters (SE-1)	Students will design, build and test model roller coasters, while applying laws of physics and principles of design.	Gr. 5	Technological problem-solving skills to design, build and test a device that transforms one type of energy into another; Law of Conservation of Energy	Understanding Earth and Space Systems: Conservation of Energy and Resources	Mechanical Engineering
Rocket Science! (SE-2)	Students will build and test rockets to investigate the principles of aerodynamics.	Gr. 6	Components of the solar system; technological tools and devices needed for space exploration; physics of flight and forces acting on an object in flight	Understanding Earth and Space Systems: Space	Aerospace Engineering

IN-SCHOOL WORKSHOPS 2015 BOOKING FORM

CONTACT INFORMATION

MAIN CONTACT:

FIRST NAME

LAST NAME

PHONE NUMBER

EMAIL ADDRESS

SCHOOL:

SCHOOL NAME

BOARD

ADDRESS:

STREET NO. & NAME

CITY

POSTAL CODE

NEAREST INTERSECTION TO SCHOOL

PHONE:

PHONE

EXTENSION

WE OFFER IN-SCHOOL WORKSHOPS ON THE FOLLOWING DATES: MONDAY TO FRIDAY FROM MAY 11 TO JUNE 12, 2015.

To schedule workshops outside the May 11 to June 12 window, please email your preferred dates to workshop@ecf.utoronto.ca to check availability before submitting this form.

Which dates would you prefer us to visit your school?

REQUESTED DATE:

ALTERNATIVE DATE:

To help us schedule your workshops, please provide your school schedule:

START:

LUNCH:

END:

WORKSHOP REQUESTS

Please note: Each workshop can accommodate a maximum of 30 students. All workshops are held at your school unless otherwise specified. Workshops are also available at U of T's St. George campus by special request. Please email us at workshop@ecf.utoronto.ca for more information.

TEACHER	GRADE	NO. OF STUDENTS	WORKSHOP TITLE	START TIME	END TIME
1.					
2.					
3.					
4.					
5.					
6.					
7.					
8.					
9.					

If you are not booking online, please email or mail this form to us. After we receive your form, we will send you a confirmation and invoice to the email address provided. Workshops are not officially booked until you receive confirmation. We look forward to hearing from you!

CONTACT IN-SCHOOL WORKSHOPS

In-School Workshops, University of Toronto 35 St. George Street, Room 173, Toronto ON M5S 1A4 Canada

Email: workshop@ecf.utoronto.ca | Online registration: www.uoft.me/isw | Tel: 416-978-3872



The University of Toronto's Faculty of Applied Science & Engineering is committed to inspiring young minds in the areas of science, technology, engineering and math (STEM). We achieve this through a wide range of year-round, hands-on programs for children of all ages. Last year, we reached more than 5,000 pre-university youth. Some of our programs include:

Jr. DEEP (summer, Gr. 3–8)

Girls' Jr. DEEP (summer, Gr. 3–8)

Jr. DEEP Saturdays (fall and winter, Gr. 3–8)

Girls' Jr. DEEP Saturdays (fall and winter, Gr. 3–8)

Jr. DEEP at March Break (March, Gr. 3–8)

DEEP Summer Academy (summer, Gr. 9–12)

HOW TO BOOK AN IN-SCHOOL WORKSHOP

- 1 Select your workshops.** We offer a wide range of workshop topics that are grade-specific, fun and kid-friendly. Each workshop is 2.5 hours in length. We are pleased to offer special pricing workshop packages for schools. If other teachers in your school are interested in booking workshops, we encourage you to book together to save money. Please note, each workshop can accommodate a maximum of 30 students.
- 2 Complete the booking form.** We schedule workshops on a first-come-first-served basis. Book early for preferred dates!
- 3 Send your completed form to our office by mail or email, or book online:**

BY MAIL: In-School Workshops, University of Toronto
35 St. George Street, Room 173, Toronto, ON M5S 1A4

BY EMAIL: workshop@ecf.utoronto.ca **ONLINE REGISTRATION:** www.uoft.me/isw

After you receive your confirmation, leave the rest to us!

Our instructors will bring all the necessary materials for all activities.



Engineering

ENGINEERING OUTREACH OFFICE, UNIVERSITY OF TORONTO

35 St. George Street, Room 173, Toronto, ON M5S 1A4 Canada
workshop@ecf.utoronto.ca | www.outreach.engineering.utoronto.ca
Tel: 416-978-3872

WORKSHOP PACKAGES & PRICING

Booking In-School Workshops with other teachers in your school is the most cost-effective way to bring these enriching workshops to your classroom. Packages can be split among different grade levels and classrooms (maximum 30 students per workshop) within your school, but all workshops must occur on the same day.

SCHOOL PACKAGE I: FULL-DAY \$1,700

12 workshops @ 2.5 hrs each

SCHOOL PACKAGE II: HALF-DAY \$875

6 workshops @ 2.5 hrs each

INDIVIDUAL WORKSHOPS \$160

1 workshop @ 2.5 hrs each

Priority will be given to schools with multiple bookings.



Actua provides training, resources and support to its national network of members located at universities and colleges across Canada in the delivery of science, technology, engineering and mathematics (STEM) education outreach programming. Each year these members engage over 225,000 youth in 500 communities nationwide. Please visit Actua at www.actua.ca.

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