Mount Royal University Session Descriptions 2019

IMPORTANT SAFETY NOTE: For the safety of participants in **ALL sessions**, ***Explore STEM*** and **Mount Royal University** will be strictly enforcing the following:

- participants must wear long pants;
- wear closed-footed shoes (no flip flops or sandals);
- tie back long hair;
- wear a lab coat and safety glasses (if provided) and;
- NO eating or drinking in the labs.

Failure to comply will result in students not being permitted to participate.

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Alice in Wonderland - a programming adventure!
Computer programming is a misunderstood art form, even though it exists in almost every area of our lives. With the help of "Alice" you will learn how to build your own animated story, 3D video game or music video just by interacting with objects in a virtual 3D world. Playing games is fun, but programming games allows you to express yourself and watch others have fun with your creation.

Design & Make Your Own Ring
In this session you will learn how to design and 3D model a ring to be 3D printed. In this active session you will create a ring to wear!

Design Thinking + Doing
The group will be introduced to the idea of design as a discipline, its applications, and its connection to other STEM fields. We will also introduce a problem that we will be applying the design process to in the subsequent sections of the workshop. Participants will then engage in the full design process including inspiration, ideation, and implementation. Each of these phases will involve a short presentation about the purpose of and methods used to complete that phase and an activity that students will complete in smaller groups to push our work on the central problem forward.

The session will conclude with a hands-on creation activity that will help participants capture their learning in a visual way.

The main focus will be on the design process and the universal tools and methods that designers use. We won't be using computers to create anything, this will be an analog workshop so participants can focus on the problem and process, rather than the mechanics.

Environmental Science Careers and Environmentalists
Become and environmentalist and take care of your world. Discover how anyone can make a small environmental footprint. Learn about the MRU science degree/work experience program and get a job in environmental science. Enjoy a tour of environmental labs at Mount Royal and see different research activities.

Gene Hunter
Ever wondered how DNA stores biological information as a long molecule? Participants will extract DNA from strawberries, and then examine how DNA is used to store cellular instructions. Explore the software used by molecular biologists when they need to determine the identity or function of a piece of DNA, and then write "secret messages" as a gene!

How do they get all that music into your iPod?
Have you ever wondered how you can store 2000 songs on your iPod?
We will explore how music is digitized, and then spend time creating and editing our own digital music.

Intelligent Minds
In the last decade, Artificial Intelligence (AI) has gone from a science-fiction to daily reality, thanks to great strides in Machine Learning (ML). From interacting with Siri and Alexa on our personal devices, to Netflix movie recommendations, to intelligent computer game players, all are impacted by AI and ML technologies. Artificially intelligent algorithms are here, but it is the beginning. In the future, AI and ML are going to revolutionize more aspects of our lives. This workshop intends to introduce AI and ML to students and prepare them for building their future intelligent world! In this workshop, students will become familiar with AI and ML technologies and applications and will do hands-on experiments to understand how they work.

It's a party – A code party!
You're invited to our first "Made with Code" party at Mount Royal University! Code touches every part of our world — and no matter what you want to be when you grow up, code and computer science skills can help you get there. Join us for a fun intro on how to get started using code to build the world you want to live in. Hear how women coders around the world are creating a better future. Come explore basic coding concepts through projects on Google's Made with Code. No prior coding experience is needed!

I've Got a Secret: An Introduction to the Science of Secrecy
For centuries there has been an ongoing battle between people who study how to send secrets in private (by practicing cryptography) and people trying to steal these secrets (using cryptanalysis). Join us for an interactive and historical look at the science of secrecy!

Seeing the Invisible
Have you ever thought about being or wished to be invisible? But is there really such thing as being invisible? Come and join us in learning and exploring how to see things that we might have thought to be invisible like your breath, a cough or even the rays coming out of your remote control.

Symmetry: the fascinating world of art, computing and mathematics.
Math + Photoshop = Art
In this session, you will use a few ideas from mathematics and Adobe Photoshop to create a tessellation from your choice of pictures. A tessellation is a tiling with all tiles the same shape and no gaps between tiles. Our end result is an amazing design you can use as a screen saver or print off to show your friends.

The Beauty of Chemistry and the Chemistry of Beauty
Chemistry is involved in how your body absorbs nutrients from the food you eat, and how your cell phone works; it explains why you use shampoo to wash your hair, and is important in the color, texture, and scent of make-up and perfume. Learn how technology is used to model molecular structure and behaviour, and then enter the lab to make your own skin cream to take home with you.

> **NOTE:** For lab safety students must be wearing pants that cover the leg and ankle, and shoes that enclose the foot. **Sandals and ballet-style slippers are not acceptable**.

The Thrill of Flight
Be a pilot in an aviation simulator. Learn how to conduct a take-off, leave the runway surface and fly up into the great blue sky!

Where IS that Hidden Treasure?
Geocaching is the latest game around: 'geo' for 'geography', and 'cache' for 'hidden stash'. We use a GPS to find hidden treasure, and in the process learn about map reading, and the use of Global Positioning Systems for locating and navigating.

> **NOTE:** We will be outdoors so appropriate clothing is required!