37th Annual NB Math Competition Gr. 7-9

UNB Fredericton – Friday, May 10, 2019

For descriptions of these activities please see inside

◦ **Art Centre** ◦

◦ **Chemistry** ◦

◦ **Computer Science** ◦

◦ **Earth Sciences** ◦

◦ **Economics** ◦

◦ **Education** ◦

◦ **Geodesy and Geomatics Engineering** ◦

◦ **Physics** ◦

◦ **History** ◦

◦ **Mathematics** ◦

*It is **<u>required</u>** that participants attend the afternoon activities!*

Information Desks from 12:45–3:00 will be at the following locations:

- Main lobby of Head Hall
- Lobby near entrance to Science Library
- Main lobby of Tilley Hall

Awards Ceremony begins at 3:30 – Main Gym, Lady Beaverbrook Gym (LBG)

Art Centre

Making Marks

Lori Quick

Creativity enhances learning in all areas of your life! At the UNB Art Centre, there is no right and no wrong. Sometimes you just need a new perspective. All you need is an open mind and a willingness to experiment.

- **There is a sign-up sheet in the lobby near entrance to Science library.** Please sign up as the number of students who can participate is limited.

Assemble	Lobby near entrance to Science Library	
Time	1:10–1:40	2:00–2:30
Capacity	20 students per session	

Chemistry

Chemical Magic

James Tait

Various demonstrations that involve simple chemistry producing magic potions, illusions, tricks or familiar odors.

Assemble	Lobby near entrance to Science Library		
Time	1:10–1:40	2:00–2:30	2:45–3:15
Capacity	50 students per session		

Computer Science

Hiding in Plain Sight!

Leah Bidlake

Discover Steganography, the art of concealing text and images in plain sight. Steganography involves finding the hints or flags that have been hidden in an ordinary medium such as an image. Learn about different media filetypes and how files can be hidden and obscured in them. Then see if you can uncover the secret message that is hiding in plain sight!

Assemble	Main Lobby of Head Hall	
Time	1:10–1:55	2:15–3:00
Capacity	20 students per session	

Earth Sciences

Landslides with Lego

Ann C. Timmermans

Who are the people that build safe structures that will not fall down - even after an earthquake? Or stabilize slopes so rocks will not fall on you or your home? Or build on ideas that can save our environment? Geological Engineers! Geological Engineering is one of the rapidly growing fields of engineering reflecting society's developing interest in the stewardship of the environment, managing risk, and creating a safer world. Join us to learn about LANDSLIDES and work on saving a nearby town from destruction!!

Assemble	Lobby near entrance to Science Library	
Time	1:10–1:40	2:00–2:30
Capacity	30 students per session	

Economics

Where does money come from? How can we create money?

Murshed Chowdhury

Do you know how the banks create money? Is it possible to create as much money as banks' wish? Who controls it? You? Bank of Canada? Would you like to learn and understand the money creation process with simple financial structures? Would you like to play games and learn how you can play an important role in the money creation process? You will be introduced to the detail money creation process in an economy with a simple banking structure.

Assemble	Main Lobby of Tilley Hall Tilley 223		
Time			2:45-3:15
Capacity			25 students

Faculty of Education

Mathematical Games and How They Work

John McLoughlin

We will play a few quick mathematical games and look at how they work. Why can one game never end in a tie? How can one guarantee winning if playing first in another game? Join us if you like to play and ponder such questions.

Assemble	Tilley 104		
Time	1:10–1:40	2:00–2:30	
Capacity	30 students per session		

Geodesy and Geomatics Engineering

Visualizing the Earth in 3D

Ian Church

We'll examine how to measure the depth of the oceans and height of the hills and mountains around us. We'll also look at how we can represent these features digitally in three dimensions so that everyone can use and explore the data.

Assemble	Main Lobby of Head Hall		
Time	1:10–1:40	2:00–2:30	
Capacity	30 students per session		

Physics

Light and Optics

Dan Trojand

We will investigate how light interacts with our world. Looking at different coloured sources, lenses, and prisms to gain insight into the nature of light. Learn some of the basics behind how some common optical devices work

Assemble	Lobby near entrance to Science Library		
Time	1:10–1:40	2:00–2:30	2:45–3:15
Capacity	30 students per session		

History

The Real Walking Dead

Gary K. Waite

Vampires: the very word raises the hair on the back of the head, or used to before the Stephenie Meyer Twilight series made vampires cute. Whether you are familiar with the 19th century literary Dracula, or the current The Walking Dead, the idea of the dead coming back to life is one of humanity's scariest. Using descriptions written by eye witnesses and some intriguing images, in this short session we will explore some of the interesting history of this belief and how people dealt with the dead who insisted on rising from their graves, concluding with the great Hungarian Vampire epidemic of 1755. This is merely one of the fascinating subjects that historians are researching and teaching today!

Assemble	Tilley 102		
Time	1:10–1:40		2:45–3:15
Capacity			

History

Witches- Why Burn Them

Gary K. Waite

Step into the time capsule for a trip back to one of the most interesting periods in history, to a time when the scientific revolution was just beginning yet when the universe was very frightening. Five hundred years ago (1400-1750) many perfectly sane citizens, judges, government leaders and (gulp!) university professors, became utterly convinced that the Devil was plotting the destruction of the world and using witches as his secret agents. As a result, thousands of people, mostly women, were legally executed for supposedly performing evil magic, flying on broomsticks and keeping demonic house pets (never trust your cat again!). While we no longer fear flying witches, they remain popular themes in modern culture. It's up to the historian to explain not only the what, but the why of this event and how it can help us to better comprehend our own world.

Assemble	Tilley 102		
Time		2:00–2:30	
Capacity			

Mathematics

Ropes, Knots and Mysteries in Space

Barry Monson

Knots, links, braids are all things you can make with ordinary ropes or string. But actually they make a rich and modern mathematical subject - a kind of concrete geometry, with unexpected behaviour.

Assemble	Tilley 125		
Time	1:10–1:40	2:00–2:30	2:45–3:15
Capacity	25 students per session		

Mathematics

Combing a Sphere, Combing a Doughnut

Nicholas Touikan

I will discuss a result in mathematics called the Hairy Ball Theorem, which not only limits the hairstyles that can be given to a sphere but also describes physical phenomena such as hurricanes. The proof of this result is not very hard, but requires some math you may not have seen before.

Assemble	Tilley 124		
Time	1:10–1:40	2:00–2:30	
Capacity	25 students per session		