2020
Seven Eight Enrichment Days (SEEDS) Program
Course Descriptions
Engineering: Creating Sustainable Solutions

Course Description
Have you ever wanted to design your own prototype? Thinking about engineering as a possible future career? In this introductory course, you will explore the world of engineering and apply the design process to create sustainable solutions to various problems we face in modern society. You will learn about the different disciplines of engineering and how they work together to solve the global complex challenge of harnessing renewable energy sources. From wind turbines to solar vehicles, you will also work in teams to apply your newfound knowledge and skills to design and build prototypes to solve various sustainable design challenges.

Instructor Biography
ESU has been collaborating with Connections: Queen’s Faculty of Engineering and Applied Science Educational Outreach Program, since 2014. Instructors for this course are specially selected and supervised by the Manager of Connections.

Engineering: Makerspace Technology

Course Description
Are you interested in working with digital technologies such as 3D printers, virtual/augmented reality, and programming applications? In this introductory course, you will learn the process of Design Thinking and Making by planning, innovating, and building with tools and materials to produce shareable artifacts. You will also learn how these digital technologies are being used in cutting-edge engineering disciplines such as computer, electrical, and medical. Are you ready to take a hands-on approach to design while exploring how engineering and technology is linked to innovations of the future?

Instructor Biography
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Engineering: Space Exploration

Course Description
Have you ever wanted to learn more about space exploration and our possible future amongst the stars? Thinking about robotics or engineering as a possible future career? In this introductory course, you will learn how engineers develop and apply the computer science, robotics, and coding elements to explore the worlds beyond ours. Working in teams as engineers, you will use applications such as the LEGO Mindstorms EV3 robot and CoSpaces to design and build creative programs to solve different challenges of space exploration. By the end of the course, you will gain newfound knowledge and skills in the disciplines of computer, electrical, and mechanical engineering.

Instructor Biography
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Epic Battles of Steel and Stone: Medieval Life

Course Description
Think you have what it takes to bring down the walls of a medieval castle? Want to know the secrets of how to defend a castle from enemy invaders? Curious to learn about the joys and perils of life in medieval Europe? Come dive into the Middle Ages with this interactive castle adventure! We will discover what life was like 500 years ago by exploring the French castle of Vincennes built in 1337 for King Charles V. Learn what it would take to be an archer in the King’s army and test your strength by wielding a medieval longbow. Build your own desktop castle and then challenge your defences with your very own catapult. Hang on to your helmet, the battle is about to begin!

Instructor Biography
Sean is a graduate student in the History Department at Queen’s University. His interests cover a wide range of historical topics from the Middle Ages to the present day. His PhD research focuses on espionage and diplomacy in eighteenth-century France. Sean enjoys exploring the wilderness and finding new places to hike.
How to Write the Stories You Wish You Had Read

Course Description
Do you aspire to write original stories that take readers to exciting new worlds or help them discover valuable life lessons? Do you dream of writing the next Hunger Games, Percy Jackson, or Harry Potter? This course shows you the secrets to creating great stories, including how to find and develop story ideas, create memorable characters, build an emotional roller coaster of a plot, design a story world, and write your adventure with flair.

Instructor Biography
Glen has been a freelance writer since 1999 and has been instructing with ESU since 2013. He is the author of the award-winning middle-grade novel, Dancing on the Inside, and currently teaches creative writing at St. Lawrence College in Kingston, Ontario.

Human Anatomy: Get to Know Your Insides

Course Description
Have you ever wondered how many bones are in your body? Or what muscles help you speak, eat and kick a ball? This course will help you understand all this and more! Through hands-on activities and a visit to the Anatomy Lab, you will learn about your brain, the musculoskeletal system, how your heart works to circulate blood throughout your body, and the path of food from your mouth to all the way out. You will also explore injuries, what happens when our systems fail to function properly, and what happens when diseases develop. This course uses real bones and organ models during activities and culminates with an animal organ dissection lab.

Instructor Biography
Instructors for this course are graduate students studying and working in the Department of Biomedical Science at Queen’s University. Many of them are currently completing their Master’s degree in Anatomical Science at Queen’s.
I Could Make That! Art History & Practice

Course Description
Have you ever seen artwork and thought, “What’s the big deal? I could make that!” Sometimes when we look at works of art, we have so many questions: Why was it made? Who did it? And how? In this course, we will uncover the stories behind overlooked art — from the outsiders to the outdoors — and get messy experiencing it for ourselves. We will also explore the art in our own backyard, and discover what it takes to put on an art show with your very own creations! If you enjoy learning new things, being hands-on, and letting your creativity flow, join us for this journey through art history and practice.

Instructor Biography
Delaney is an Art History graduate student at Queen’s University. Her research currently focuses on Netherlandish butchery still-life painting. She has a background in drawing and painting, appearing in art shows in Montreal. Delaney has worked with the Southwestern Ontario Suzuki Institute’s youth Operetta program in production design, and spent time volunteering with various galleries.

Let’s Discover the Code Behind a Website!

Course Description
Have you ever wondered how to create a website and publish it online? Are you looking for an opportunity that opens the programming door to you? Are you ready for a fun and impactful web development experience? If yes, then this is the course for you! Learn the basic techniques to build your first website and get familiar with the most up-to-date web programming languages through hands-on sessions. Get ready for this crash course in coding!

Instructor Biography
Maram is a PhD student in the School of Computing at Queen’s University. Her research interests focus on Machine Learning, Natural Language Processing, and Software Engineering. A former teacher, Maram has taught computer related courses to undergraduate students. She also has six years of work experience in the software development field. Maram is excited to introduce you to the world of programming!
### Travelling Through Time in the Limestone City

**Course Description**
Join us on this experiential learning course where we will explore the local history of Kingston by visiting historic sites, statues, and monuments that will encourage you to think critically about Canada’s past. You will learn to think like a historian while considering topics like war and society, Indigenous peoples, and popular culture. You will also have the opportunity to examine primary sources, create your own artifacts, and debate controversial topics of today. Come along with us as we travel through time to learn more about the past, present, and future of the Limestone City!

**Instructor Biography**
Sara is a PhD student in the Faculty of Education at Queen’s University and is currently researching history education and experiential learning. She is also an elementary and high school teacher in Ontario, and has led student battlefield tours in Europe for the Vimy Foundation. Sara created this place-based experiential learning course to connect students with local history and make learning about the past engaging.

### Pathology: From DNA to Forensics

**Course Description**
Do you dream of becoming a Crime Scene Investigator? Want to investigate a mock crime scene? Then this course is for you! You will learn about the human body, diseases, DNA, and genetics through hands-on activities including: a genetics testing lab, dragon genetics lab, blood typing (with simulated blood), and examining plastinated specimens. You will also learn forensics skills such as fingerprinting, and handwriting analysis. Are you ready to solve the case?

**Instructor Biography**
Dr. Mackenzie Bowman has been coordinating ESU courses since 2010, and holds a PhD in Pathology and Molecular Medicine. She is currently a Senior Scientist in the Clinical and Molecular Hemostasis Research Group at Queen’s University. Instructors for this course are specially selected and supervised by Dr. Bowman.
What’s Beneath the Surface? The Study of Lake Life

Course Description
Did you know that Earth is often called “the water planet” because it has approximately 14,000 cubic kilometers of water? Want to try your hand at collecting lake samples and discovering what lives beneath the surface of our lakes? Through hands-on activities and lessons, you will learn about phytoplankton, zooplankton, and fish and how the interactions between them provide us with opportunities for recreation, employment, and food. You will also learn what makes a healthy lake ecosystem and how you can tell. Finally, you will explore how lake ecosystems are changing with human development and impact. We dare you to dive into this lake course!

Instructor Biography
Robin is a graduate student in the Biology Department at Queen’s University. Her research interests focus on lake ecology, specifically the impact of additions of road salt on lake ecology in Ontario. Over the summers, she enjoys spending her time canoeing and collecting samples from lakes all over Ontario.