

48th College Chemistry Canada (C3) on Zoom

Abstracts

- Abstracts listed in order of Presentation.
- Welcome, Thursday Opening, AGM, General Student Scholarship Award Presentation & Friday Closing will be in Zoom Session Room 1.
- 'letter'1 corresponds to Group Session (e.g. Thursday A1-1, A1-2, A1-3 will be presented in Zoom Session Room 1)
- 'letter'2 corresponds to Group Session (e.g. Thursday A2-1, A2-2, A2-3 will be presented in Zoom Session Room 2)

Note: Click on a 'Presentation Title' and it will link to the Abstract [PDF viewer]

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| Presentation: | Thursday Plenary #1. 9:10 – 9:35 am |
| Name / Affiliation: | Alison Flynn, University of Ottawa |
| Title of Presentation: | Building Connections and Learning Skills with Informal and Formal Approaches |
| Abstract (brief): | <p>Building resilience and relationships: we have so many opportunities in formal and informal ways! In this presentation, I will share some options, including a Growth & Goals Module that we developed to better support and empower students in developing learning skills, autonomy, resilience, and professional capacity skills. The module can be integrated within any given course, is an open education resource (OER), is available in Pressbooks and Brightspace in French and English, and can be readily modified to suit a variety of contexts. I will describe the module's intended learning outcomes, use, and key features, and share preliminary evaluation findings from the module's integration in five different courses. The module and instructions are available on our website: FlynnResearchGroup.com/GrowthGoals.</p> <p>Résilience et création de liens : nous avons tant d'opportunités de manière formelle et informelle! Lors de cette présentation, je partagerai quelques options, y compris un module de croissance & d'objectifs que nous avons développé pour mieux soutenir et responsabiliser les étudiants dans le développement des compétences d'apprentissage, de l'autonomie, de la résilience et des capacités professionnelles. Le module peut être intégré dans n'importe quel cours, étant une ressource éducative ouverte (REL), est disponible dans Pressbooks et Brightspace en français et en anglais, et peut être facilement modifié pour s'adapter à une variété de contextes. Je décrirai les résultats attendus du module d'apprentissage, son utilisation et ses principales caractéristiques, et je partagerai aussi les résultats de l'évaluation préliminaire de l'intégration du module dans cinq cours différents. Le module et les instructions sont disponibles sur notre site Web : FlynnResearchGroup.com/GrowthGoals.</p> |

Thursday A1 Session 9:35 – 10:20 am. Concurrent with A2 Session.

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| Presentation: | Thursday A1-1 |
| Name / Affiliation: | Andrew P. Dicks, University of Toronto |
| Title of Presentation: | "Language Matters": Some Musings on Terms We Use As (Chemistry) Educators |
| Abstract (brief): | My mother used to (and sometimes still does!) tell me to mind my language. Words matter, and some of the ones we use in education ("lecture" and "teaching load" among others) can provide an inaccurate representation of what we are trying to articulate. This presentation—without research findings or any kind of study—is a short reflection on some common language that might be reframed in our classrooms and departments more broadly. |

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| Presentation: | Thursday A1-2 |
| Name / Affiliation: | Amanda Coolidge, BCcampus |
| Title of Presentation: | Improving Access to Chemistry with STEM Open Educational Resources |
| Abstract (brief): | In this session, Amanda Coolidge will walk participants through the what why, and how of open educational resources (OER) and showcase examples of OER in Chemistry. She will share issues of access, affordability, and equitable design principles that lay the foundations for open practice in STEM. In addition, Amanda will share examples of remixing and revising educational materials from the post-secondary environment, discuss the quality of OER, and provide explanations of Creative Commons and copyright. |

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| Presentation: | Thursday A1-3 |
| Name / Affiliation: | Kathy-Sarah Focsaneanu, University of Ottawa |
| Title of Presentation: | "Gen Chem for Gee-Gees": Producing an Open Textbook for uOttawa Students |
| Abstract (brief): | University textbooks are expensive, French-language textbooks even more so. To address this issue, a collaborative team of faculty members and undergraduate students worked for nearly 2 years to compile, edit, and publish an open bilingual textbook, tailored specifically to the content taught in introductory chemistry courses at uOttawa. This past fall, the first complete editions of the book, in both languages, were published online for all students to freely access via PressBooks. This video will briefly describe our journey to create these resources, the challenges we encountered, and lessons learned during the process. |

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| Presentation: | Thursday A1-4 |
| Name / Affiliation: | José Rodríguez Núñez, University of British Columbia |
| Title of Presentation: | Interviewing Skills for Graduating Students |
| Abstract (brief): | Graduating students receive extensive training with regards to the fundamentals and applications of chemistry. More recently, efforts to teach transferable skills have become important in curriculum design. Despite these changes, students receive little training about how to effectively present themselves in a job interview. In this furious five minute talk, I will discuss how I became aware of this deficiency and the changes I have implemented or plan to implement to address this shortcoming. |

Thursday A2 Session 9:35 – 10:20 am. Concurrent with A1 Session.

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| Presentation: | Thursday A2-1 |
| Name / Affiliation: | David Stone, University of Toronto |
| Title of Presentation: | Playing Bass Guitar to Teach FTIR |
| Abstract (brief): | Bass is fundamental to music, and vibrations are fundamental to IR spectroscopy. So what could be more harmonious than using one to illustrate the other? Not only does this allow the instructor to wake up any sleepy Jeans, it makes for a note-worthy live audio-visual presentation. In addition, it illustrates that artistic expression is not reserved to non-scientists, and allows students to see a more personal side of their instructor. Of course, IR is just one motif in a complex symphony of themes that can be explored musically, so stay tuned! |

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| Presentation: | Thursday A2-2 |
| Name / Affiliation: | Jennifer Wolf, BCIT |
| Title of Presentation: | In-Person? Online? Blended? Which Works Best for Students? |
| Abstract (brief): | Tech Entry is a full-time one-semester program at BCIT for students to take high-school level STEM and technical writing courses to prepare for a diploma or degree program at BCIT. For the 2020-2021 academic year, the Tech Entry program was run completely online. For 2021-2022, we ran the program in a blended fashion, with three days on campus and two days online. The intention was to take the best of what worked in the online experience while also giving students important practical hands-on in-person teaching. In this talk I will describe what we learned in the process and how we will proceed with the program in the future. |

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| Presentation: | Thursday A2-3 |
| Name / Affiliation: | Kristy M. Erickson, Red Deer Polytechnic |
| Title of Presentation: | More than Marshmallows: A Brief Presentation of a Student Activity for Learning 3D Geometric Shapes |
| Abstract (brief): | At Red Deer Polytechnic (formerly Red Deer College), an in-class activity was designed and implemented by the author in several first-year Introductory I chemistry classes. The activity consisted of students building various geometric shapes using marshmallows and toothpicks and completing an activity sheet which had students do the following: identify the geometry and shape name, identify the VSEPR class, draw the shape they had built (including appropriate bond angles), and write out an explanation for why the shape has the name it does. This presentation will highlight the activity and some quantitative and qualitative results obtained from pre- and post-activity quizzes and student questionnaire responses. |

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| Presentation: | Thursday A2-4 |
| Name / Affiliation: | Scott Sinex, Prince George's Community College (MD, USA) |
| Title of Presentation: | Ocean Acidification: Data & Chemical Concepts via Interactive Spreadsheet |
| Abstract (brief): | Is seawater responding to increased atmospheric carbon dioxide levels? Let's examine data and mathematical models (linear regression or line of best fit) from Hawaii to see. Using Henry's law and the behavior of a weak diprotic acid (via the distributions of chemical species by a bar graph and distribution diagram, fraction vs. pH), explain why the pH of seawater is becoming more acidic, a lower pH. Students can examine and analyze data for two other sites on this Google Sheets spreadsheet at https://sites.google.com/view/ssinex/home/excelets . |

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| Presentation: | Thursday Plenary #2. 11:15 – 11:40 am |
| Name / Affiliation: | Kelly Resmer, Mount Saint Vincent University |
| Title of Presentation: | Future of Chemistry Laboratory Learning? |
| Abstract (brief): | <p>Unexpected online laboratories forced many to re-think how labs were delivered. Moving forward, how can we use these lessons and resources to improve the accessibility, inclusivity, and effectiveness of lab-based learning? Incorporating accessible features, preparing students for meaningful learning, and focusing on learning outcomes can help instructors determine how best to deliver content and labs. Supporting returning chemistry majors to my in-person lab involved using lab badges to assess hands-on lab skills, minds-on experiments with more inquiry-based labs, and the lab was 'un-graded'. Team-based lab learning with student lab mentors was also valuable to bridge lab learning gaps.</p> <p>Les laboratoires en ligne inattendus ont forcé plusieurs d'entre nous à repenser la manière dont les laboratoires étaient dispensés. En allant de l'avant, comment pouvons-nous utiliser ces leçons et ressources pour améliorer l'accessibilité, l'inclusivité et l'efficacité de l'apprentissage en laboratoire? L'intégration de fonctionnalités accessibles, la préparation des étudiants à un apprentissage pertinent et l'attention particulière portée sur les résultats d'apprentissage peuvent aider les titulaires à déterminer la meilleure façon d'offrir du contenu et des laboratoires. Le soutien apporté aux apprentis-chimistes qui revenaient en personne dans mon laboratoire a impliqué l'utilisation de badges de laboratoire pour évaluer les compétences pratiques du labo, davantage de laboratoires basés sur l'enquête, et des expériences qui n'étaient pas corrigés. L'apprentissage en laboratoire, en équipe, et avec un mentorat d'étudiants, a également été utile pour combler les lacunes en matière d'apprentissage en laboratoire.</p> |

Thursday B1 Session 11:40 am – 12:05 pm.

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| Presentation: | Thursday B1-1 |
| Name / Affiliation: | Adnan Chaudry, Vernier Canada |
| Title of Presentation: | Chemistry Lab Solutions from Vernier |
| Abstract (brief): | Vernier Canada offers a full line of award-winning interfaces, sensors, software, and lab books to help engage and excite students through hands-on scientific investigation. When you teach with Vernier technology, you're teaching with a complete chemistry solution. From titrations to spectroscopy, our sensors and instrumentation are backed by powerful analytical software, college/university level experiments, and unparalleled support. For many years, colleges and universities across Canada have relied on our durable hardware to help instructors teach key concepts. Vernier technology can provide your students with practical, relevant data-collection and analysis experience. |

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| Presentation: | Thursday B1-2 |
| Name / Affiliation: | Kiyo Monteith and Katy Turenne, Macmillan Learning |
| Title of Presentation: | Engaging the Post-Pandemic Student |
| Abstract (brief): | We have been hearing from instructors across Canada that post-pandemic students are less prepared than ever, and are struggling with their transition to post-secondary. In this session we will discuss a number of strategies to better engage the post-pandemic student, and how to help them develop strategies to become more successful learners. Our system Achieve was built on learning science research, and was designed to support students at every stage of the learning path. Make sure to join our session as we share with you how instructors are utilizing Achieve to engage their students, while using data to better understand each individual's unique challenges and needs. |

Thursday B1 Session 12:05 – 12:30 pm. Concurrent with B2 Session.

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| Presentation: | Thursday B1-3 |
| Name / Affiliation: | Yuriy Barchuk, Miranda Brown, Sarah Madore and Kelly Resmer, Mount Saint Vincent University |
| Title of Presentation: | Re-Designing Labs with Student Collaborators to Enhance Engagement and Accessibility for More Meaningful Lab Learning |
| Abstract (brief): | The teaching laboratory has become intrinsic to quality scientific education. Correlations have been found between the level of student interest in the experiment and their resulting information acquisition and retention. Fourth year chemistry majors enrolled in a directed study aimed to enhance the design of three undergraduate lab experiments, guided by Universal Design for Learning principles (UDL) to create accessible and engaging laboratory experiences. These students will present their lab re-designs that involved engaging students via prelab preparation, promoting goal setting, relating concepts to everyday life, student collaboration, and options for post-lab activities to facilitate student understanding. |

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| Presentation: | Thursday B1-4 |
| Name / Affiliation: | Marco Zimmer De-Luliis and Lana Mikhaylichenko, University of Toronto Scarborough |
| Title of Presentation: | Designing New Advance General Chemistry Course for Students with Students |
| Abstract (brief): | Designing a new laboratory component for a course is always a challenge for the instructor. Many factors should be considered during this process. We decided that this barrier could be overcome with the help of students themselves! Several upper year undergraduate students were involved in all stages of developing a new laboratory course, starting from course planning meetings and culminating with writing and proofreading the laboratory manual itself. This laboratory course was very well received by our winter 2022 students with the extremely positive feedback. We will discuss steps involved with the course development and provide some comments from students who helped to create it and who just finished taking it. |

Thursday B2 Session 12:05 – 12:30 pm. Concurrent with B1 Session.

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| Presentation: | Thursday B2-1 |
| Name / Affiliation: | Murray Bronet, John Abbott College |
| Title of Presentation: | OCLaRE - A Platform for Scaffolding Student Lab Report Writing |
| Abstract (brief): | OCLaRE (Online Collaborative Lab Reporting Environment), an online platform designed to help students improve their laboratory report writing, will be showcased. OCLaRE employs a scaffolding approach to a writing-to-learn pedagogy wherein students participate in producing lab reports more reflective of the culture and community of science. Students interact with partially pre-written templates to complete professionally formatted laboratory reports. OCLaRE helps mitigate the limited ponderation available for report writing by automating selected tasks—performing tedious computations, producing graphs, and formatting—that are essential to a given evaluation. Participants will be introduced to this scaffolding pedagogy and its implementation for report writing. |

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| Presentation: | Thursday B2-2 |
| Name / Affiliation: | Alyssa Doué, Mount Saint Vincent University |
| Title of Presentation: | Reflective Thinking: Finding Relevance for Non-Chemists |
| Abstract (brief): | A common complaint I've heard from non-chemistry majors required to take an organic chemistry lab is that they feel nothing they learn in the lab is relevant to their future careers. This year I decided that instead of telling students why the lab is important, I would ask them to think about and reflect on their experience in lab and tell me what they learned that was relevant to their future. With this activity, I better understood student's goals and motivations, and they were able to recognize the soft skills they learned which will help them succeed in the future. |

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| Presentation: | Friday Plenary #3. 9:00 – 9:25 am |
| Name / Affiliation: | Geoff Rayner-Canham, Grenfell Campus, Memorial University, Corner Brook, NL |
| Title of Presentation: | Inuit-Indigenizing a Distance 'Chemistry in Everyday Life' Course |
| Abstract (brief): | <p>For years, we have offered a very popular distance course relating chemistry to our lives. As part of the University's indigenization goals, we have incorporated Inuit life & culture into the course. By remarkable coincidence, the first (very successful) offering was to Inuit students of Nunavut Arctic College.</p> <p>Pendant plusieurs années, nous avons offert un cours à distance très populaire reliant la chimie à nos vies. Dans le cadre des objectifs d'indigénisation de notre Université, nous avons intégré la vie et la culture inuites dans le cours. Par une coïncidence remarquable, la première instance (très réussie) a été offerte aux étudiants inuits du Collège de l'Arctique du Nunavut.</p> |

Friday C1 Session 9:25 – 10:25 am

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| Presentation: | Friday C1-1 |
| Name / Affiliation: | Charles Lucy, University of Alberta Kate R. Reis and Zachary L. Mensinger, Metropolitan State University, Saint Paul, MN |
| Title of Presentation: | Diversity in Analytical Chemistry Initiative |
| Abstract (brief): | "Male, stale and pale" is how the chemists profiled in textbooks are often described. The Harris and Lucy Quantitative Chemical Analysis textbook prides itself on inclusion of examples from the modern literature. So surely, our depiction of science is more diverse. While compiling the Index for the text, I was horrified to find only four entries for "Women in analytical chemistry" and no entries for "BIPOC in analytical chemistry". A particular resource that has been invaluable in enhancing representation in the QCA textbook is the DiversityinChemistry collection at |

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| | https://sites.google.com/view/diversityinchemistry/home?authuser=0 . This site and its resources will be overviewed in the talk. |
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| Presentation: | Friday C1-2 |
| Name / Affiliation: | Owen Scadeng, Concordia University of Edmonton |
| Title of Presentation: | Introducing EDI Topics in the Undergraduate Classroom |
| Abstract (brief): | An important aspect of being an ally in the EDI space is to aid with the labour burden too often placed on underrepresented and marginalized people in academia. Furthermore, students within these groups can often feel isolated and without the connections to faculty that other students experience. One place where we can lessen this burden is within our own classrooms by holding space for class discussions and covering statistics impacting various groups. The challenge, however, is finding the right course to best facilitate discussions. Recently, CUE introduced a career prep course, creating an ideal space to cover these issues. This course will discuss initial observations about implementation of an EDI unit within this course. |

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| Presentation: | Friday C1-3 |
| Name / Affiliation: | Jennifer L. MacDonald and Nick Roberts, Dalhousie University |
| Title of Presentation: | From Comment to Collaboration to Community: The Impact of Embedding Colour Vision Deficiency (CVD) Support Into In-Person, Online, and Blended Laboratory Environments |
| Abstract (brief): | We have noticed an increase in the number of students taking part in our chemistry laboratory programs who disclose their experiences with colour vision deficiency (CVD). How do we re-design experiments and course content to implement supports that put the students and educators in control of the interpretation of colour-based data regardless of how they view colour? This is a story of how a comment between colleagues inspired a collaboration that created CVD supports which are now threaded through our lab program and discuss the impact this work has had on student learning, awareness and sense of belonging. |

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| Presentation: | Friday C1-4 |
| Name / Affiliation: | <u>Janice Zeng</u> and Robin Stoodley, University of British Columbia |
| Title of Presentation: | Promoting Diversity in Physical Chemistry through Vignettes |
| Abstract (brief): | Many educational resources only acknowledge historical scientists and thus lack diversity. To help show that anyone can become a physical chemist, I compiled a diverse list of active scientists to be featured in a physical chemistry text for UBC's CHEM205 course. The group of chemists varied between gender, age, ethnicity, and research interests. I researched academic journals, scientific news, and university pages to develop vignettes. The final list of profiles features Professors Karin Öberg, Jesús Velázquez, Zahra Fakhraai, Shahal Ilani, Alán Aspuru-Guzik, Takuro Ideguchi, Mei Hong, Devarajan Thirumalai, Artur Widera, Kristie Boering, |

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| | Sossina Haile, and Emilie Ringe. These vignettes are valuable educational resources that showcase physical chemistry as a welcoming field with various applications. |
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| Presentation: | Friday C1-5 |
| Name / Affiliation: | Katherine Cameron, Phil Mills and Molly Firlotte, John Wiley & Sons |
| Title of Presentation: | Adapting to Today's Students: A Targeted Learning Experience with Wiley |
| Abstract (brief): | With the challenges today's students face combined with recent shifts between online and in-person teaching, providing students with an individualized, scaffolded learning experience has never been more important. Wiley's adaptive technology is designed to help students learn efficiently by providing them with exactly the support they need, when they need it, in order to be successful in their course, whether it be online, face-to-face, or hybrid. |

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| Presentation: | Friday Plenary #4. 10:35 – 11:00 am |
| Name / Affiliation: | Jackie Stewart, The University of British Columbia |
| Title of Presentation: | Fostering Students' Sense of Belonging to Enhance Equity in Chemistry Education |
| Abstract (brief): | <p>Many chemistry educators strive to foster active learning environments to encourage students to learn from each other. However, research shows that while active learning supports equitable learning outcomes, some students' learning may be affected by how group work is implemented. In this talk, I will discuss active learning implementation from an equity, diversity, and inclusion perspective and share results from our investigations of students' sense of belonging in first-year biology, chemistry, and physics courses. Attendees will learn how they can foster students' sense of disciplinary and social belonging in chemistry courses.</p> <p>De nombreux professeurs de chimie s'efforcent à favoriser des environnements d'apprentissage actifs pour encourager les étudiants à apprendre les uns des autres. Cependant, la recherche en éducation montre que si l'apprentissage actif favorise des résultats d'apprentissage équitables, l'apprentissage de certains étudiants peut être affecté par la manière dont le travail de groupe est mis en œuvre. Au cours de cette présentation, je discuterai de la mise en œuvre de l'apprentissage actif dans une perspective d'équité, de diversité et d'inclusion et je partagerai les résultats de nos recherches sur le sentiment d'appartenance des étudiants dans les cours de biologie, de chimie et de physique de la première année universitaire. Les participants apprendront comment ils peuvent favoriser le sentiment d'appartenance disciplinaire et sociale des étudiants dans les cours de chimie.</p> |

Friday D1 Session 11:00 – 11:50 am.

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| Presentation: | Friday D1-1 |
| Name / Affiliation: | Justin Weinberg, Aktiv Chemistry |
| Title of Presentation: | Aktiv Chemistry: Next-Generation Active Learning Platform for First-Year & Organic Chemistry Courses |
| Abstract (brief): | Aktiv Chemistry is a next-generation active platform built specifically for first-year and organic chemistry courses. The platform helps instructors easily incorporate active learning into their classrooms and keeps students engaged outside of class with homework, extra practice, and quizzes that they can access on their smartphones and other personal devices. This short presentation will highlight some of the specific tools in Aktiv Chemistry that help students overcome barriers in topics/concepts such as drawing of Lewis structures, dimensional analysis, nomenclature, chemical equations, equilibrium calculations, and the drawing of skeletal structures and mechanisms as it applies to learning in organic chemistry. |

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| Presentation: | Friday D1-2 |
| Name / Affiliation: | Jimmy Lowe, Department of Chemistry, BCIT Yuna Chen, Health Promotion Strategist, Student Life Office, BCIT |
| Title of Presentation: | Be Caring In Teaching - BCIT Helping Students with their Well-being |
| Abstract (brief): | Students entering post-secondary look forward to their opportunities during their studies while facing both academic and non-academic challenges. There has been a marked increase in student anxiety and stress with recent events over the last few years. Interested faculty, staff and students worked with the Student Life Office to create and promote the Student Well-Being Toolkit for Instructors. BCIT's goal is to have employees build connections with students to make a positive classroom culture that improves their well-being, inclusion, and retention. This resource is part of the broader Student Well-being and Resilience Framework [1]. I will highlight (i) some of the easily adoptable activities, approaches and content of the Toolkit and (ii) the resources and tools that I have used in my classes (you are most likely doing some of these already). [1] https://www.bcit.ca/student-services/health-wellness/student-well-being-and-resilience-framework/ |

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| Presentation: | Friday D1-3 |
| Name / Affiliation: | Vishakha Monga, University of British Columbia (Vancouver) |
| Title of Presentation: | Connecting with Huge Class Sizes Virtually |
| Abstract (brief): | For the first year engineering course at UBC-V, I host zoom sessions for >800 students synchronously for the laboratory component of the course. I will be discussing challenges and pedagogical strategies associated with creating an interactive lab session with high volume of students. |

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| Presentation: | Friday D1-4 |
| Name / Affiliation: | Paul Hui, Juan Araneda and Susanne Riegel, Nanalysis Corp. |
| Title of Presentation: | Introduction to qNMR: Beyond Just Doublets and Triplets |
| Abstract (brief): | <p>Nuclear magnetic resonance (NMR) spectroscopy is one of the most commonly used techniques for characterization in chemistry. Despite pedagogical shifts towards active-learning and guided-inquiry approaches, the addition of NMR spectrometers directly into the undergraduate curriculum has remained limited. Consequently, students rarely gain hands-on experience with this technique, particularly in the beginning stages of their programs. Furthermore, NMR spectroscopy is frequently introduced as a tool used purely for structural elucidation and has been largely overlooked for quantitative applications despite its inherently quantitative nature.</p> <p>As quantitative NMR (qNMR) becomes more commonly used in both industry and academia, we are actively developing undergraduate qNMR experiments with a benchtop NMR spectrometer that could be easily incorporated into organic or analytical classes. Here we showcase potential undergraduate experiments that facilitate the incorporation of qNMR into undergraduate laboratories.</p> |

Friday E1 Session 11:50 am – 12:15 pm. Concurrent with E2 session.

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| Presentation: | Friday E1-1 |
| Name / Affiliation: | Angela Crane, Dalhousie University |
| Title of Presentation: | Leveling up your First-Year Chemistry Grade! |
| Abstract (brief): | <p>In our course, our focus has shifted of supporting mastery of skills rather than regurgitation of content, using specification grading as a model for evaluating students work. This concept pairs very well with course “gamification”, which involves introducing game-like elements into a course, such as point systems, leader-boards and badges/awards. Here you will learn the preliminary results of how a shift away from conventional grading systems (2 midterms and a final) and towards a specifications grading system was achieved through gamification of a first-year chemistry course.</p> |

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| Presentation: | Friday E1-2 |
| Name / Affiliation: | Summer Xia Li and Carl Doige, Okanagan College |
| Title of Presentation: | Student-generated videos: (Screen)-capturing learning one frame at a time |
| Abstract (brief): | <p>A pivotal component of learning and teaching is assessment. In the spirit of inclusivity and diversity, educators are being encouraged to find alternative, authentic, and meaningful ways for students to make evident their learning. Assessment involving student-generated videos promotes digital literacy (an important transferable skill), provides a low stakes environment, and taps into multimodal representations, which are especially important for communicating chemistry concepts at the macroscopic, microscopic, and symbolic levels. In this presentation, we will</p> |

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| | describe the implementation of an assessment strategy that required students to produce screen-capture videos to explain concepts and processes in first- and second-year chemistry courses. We will reflect on whether such an approach was successful in capturing aspects of student learning. |
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Friday E2 Session 11:50 am – 12:15 pm. Concurrent with E1 Session.

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| Presentation: | Friday E2-1 |
| Name / Affiliation: | Steven M. Socol, McHenry County College, Crystal Lake, IL |
| Title of Presentation: | The Use of American Chemical Society Division of Chemical Education Examinations as Assessment Tools |
| Abstract (brief): | The American Chemical Society Division of Chemical Education Examinations Institute publishes standardized examinations for all areas of undergraduate chemistry. The construction of these examinations will be discussed. Examples will be presented which illustrate how these examinations can be used as assessment tools, and help achieve consistent standards in multi-section courses. |

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| Presentation: | Friday E2-2 |
| Name / Affiliation: | Tarannum Puri and Jaclyn J. Stewart, University of British Columbia |
| Title of Presentation: | A New View on Practice Problems: How Answer Key Features Influence Students' Strategic Learning |
| Abstract (brief): | What do your answer keys look like, and why? We are investigating the ways in which features of answer keys influence students' abilities to direct and monitor their own learning. Understanding and incorporating feedback during learning is the hallmark of an effective independent learner. In this talk, we will share highlights from our study that compared how students used annotated and standard answer keys during organic chemistry problem-solving practice. During independent practice, answer keys have a role to play in supporting students' internal feedback processes and it is time for us to revisit this long-standing instructional tool. |

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| Presentation: | Friday Closing Presentation 12:20 – 12:30 pm |
| Name / Affiliation: | Yann Brouillette, Dawson College |
| Title of Presentation: | Comic Book Chemistry Part 11: Credible Transformations |
| Abstract (brief): | If someone says that chemistry is no laughing matter, the king of clowns himself, Batman's Joker, begs to differ as he uses chemistry for his punchlines. Whether it is for education, entertainment, or life-improvement, chemistry is everywhere. So are fictional characters nowadays. Using storytelling to engage students in fact driven discussions improves participation and retention. A fun and critical look at rational explanations describing out-of-the-ordinary events impersonated by heroes seen in movies, TV shows and graphic novels will be investigated. In sum, comic books and chemistry can team-up to strengthen pedagogical |

approaches to learning via STEAM-based lessons. After all, you can't punch knowledge into someone, but you can deliver a lesson that packs a punch. More at: <https://www.youtube.com/user/ChemCurious/videos>

Si on vous dit que la chimie n'est pas une blague, le roi des clowns lui-même, le Joker de Batman, nous démontre tout le contraire en utilisant la chimie pour plusieurs de ses chutes. Que ce soit pour l'éducation, du divertissement ou la qualité de vie, la chimie se retrouve partout. Tout comme les personnages fictifs de BD ces jours-ci. L'utilisation d'histoires axées sur des faits palpables stimule la participation des étudiants lors de discussions. Lors de cette présentation, un regard amusant et critique sur des explications rationnelles décrivant des événements hors du commun incarnés par des héros de films, d'émissions de télévision et de romans graphiques sera étudié. En somme, les bandes dessinées et la chimie peuvent s'associer pour renforcer les approches pédagogiques via des cours de STEAM. Après tout, vous ne pouvez pas infliger des connaissances à quelqu'un, mais vous pouvez donner une leçon qui a du punch. Pour plus d'exemples, consultez: <https://www.youtube.com/user/ChemCurious/videos>

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Nous tenons à remercier nos commanditaires pour leurs généreux soutiens à ce congrès et aux précédents. Nous les invitons à se joindre à nous lors de nos congrès futurs en personne.

