Teaching Dossier 2026

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Table of Contents

Appendices

1. Biographical Overview

Since September 2019, I have held a position as a sessional faculty member in the W Booth School of Engineering Practice and Technology at McMaster University and currently teach Master's-level courses at Northeastern University. During my tenure as a PhD and Master's student at York University, I enhanced student's learning by serving as a teaching assistant for seven years, while concurrently completing my graduate studies and engaging in various professional development activities, including educational courses, certifications, and workshops focused on pedagogy. My dedication to creating engaging, hands-on lessons that effectively meet learning outcomes was recognized with the prestigious Richard Jarrell Excellence in Teaching Award from York University. In addition to my academic responsibilities, I have held a professorship at a local college and served as a part-time professor at Seneca College. Parallel to my educational endeavors, I am employed as a scientist at Dalriada Drug Discovery, where I work in the Research and Development department. My role involves designing and executing experiments, analyzing data, and presenting findings to clients related to Molecular and Cell Biology including hit identification, target validations and covalent discovery programs. My comprehensive background in both drug discovery and Molecular Biology research not only enhances my professional capacity but also enriches my teaching by providing a real-world context to the theoretical concepts discussed in the classroom.

2. Teaching Statement/Philosophy

My teaching career has spanned more than 15 years, and I am deeply influenced by educators who captivate students' interest, clarify complex topics, contextualize knowledge, and motivate students toward success. Inspired by these experiences, my teaching philosophy is deeply rooted in student-centered education. I aim to inspire, encourage, and engage students in learning, providing them with the tools necessary for deep and rich learning.

As an instructor, I employ active learning approaches, pedagogical techniques, and scenario-based questions to develop my curriculum, ensuring that students are able to apply theoretical knowledge in real-world contexts. My courses include group assignments, scenario-based tutorials, group activities, and quizzes to engage students actively in the learning process. For instance, in the BIOTECH 2CB3 course I incorporated complex real-world scenarios that students are likely to encounter in the biotech industry. This approach not only prepares them for future professional challenges, but also makes the learning process engaging and relevant. The feedback from the BIOTECH 2CB3 course, which was enriched with newly introduced tutorials reflecting on industry practices, affirmed the effectiveness of these methods **(*Appendix 1: Feedback BIOTECH 2CB3 2022 and Appendix 11 : Feedback BIOTECH 2CB3 2025_Course)***

My Teaching Philosophy is based on three key elements.

i)Student-Centered Teaching: My lesson-planning process always prioritizes students by creating an open and safe space for them to express diverse ideas, opinions, and worldviews. Inclusivity is paramount, ensuring that every student has an equal opportunity to participate and share their insights.

ii)Active Engagement and Curiosity: Curiosity enhances the learning process, helping students retain new information and stimulating group interactions. By fostering a curious environment, I

encourage students to explore, question, and connect with the material, deeply enriching the classroom experience.

iii)Universal Design for Learning: Recognizing students' needs and crafting teaching styles using a variety of pedagogical and active approaches are fundamental principles of the Universal Design for Learning. I use Universal design for learning approaches to design the curriculum and teaching. I continuously seek to improve my teaching methods by participating in workshops and professional development courses such as Supporting Learning, Staff and Educational Development, and Instructional Skills workshops. Additionally, I completed the Professor Hippo on Campus course to support students with mental health issues and obtained Safe Talk Certification to understand students' need to create the engaging lessons.

3. Teaching Approaches

My teaching philosophy depicts my teaching approaches or strategies.

i) Engagement with Key Ideas

My preliminary task is to motivate students to understand and explore science. I tell them that science is an integral part of human nature and it sparks our desire to seek out the truth, extend knowledge, and explore. Therefore, they need to observe and explore that why and how these phenomena occur around them. I break down complex concepts into basic components and make them interesting by relatable examples and using visual aids such as drawings, graphs, and tables to reinforce key ideas.

For example, To illustrate the importance of vitamin C as an antioxidant and its role in collagen synthesis, I began by asking students to identify natural products that contain vitamin C and to note examples during their next visit to a pharmacy. To sustain engagement, I presented a range of collagen and vitamin C products and designed and demonstrated a brief DPPH-based experiment during a synchronous virtual lecture held during COVID-19. In the remote learning context, this approach helped maintain student interest and participation ***(Appendix 2: slide and screenshot of video in virtual setting during COVID-19).*** I believe that fostering a motivating and interactive learning environment is essential for promoting student exploration and deepening understanding.

ii) Interactive Learning and Critical Thinking

The second principle of my teaching is hands-on learning. As a course instructor of BIOTECH 2CB3 I designed labs that match the learning outcomes of the course. The experiments are based on the theories or concepts they are learning in the class. Labs help students remember the material better because the information gained during hands-on learning has a better chance of being stored for useful retrieval. To stimulate curiosity, I ask questions and encourage small group discussions and assignments ***(Appendix 11: Feedback BIOTECH 2CB3 2025****).*

For example, To optimize students' hands-on learning experience amidst the challenges of COVID-19, I redesigned the lab components. This adaptation allowed students to engage in all five labs in person, while strictly adhering to COVID-19 safety protocols **(*Appendix 3: Hands-on Learning during COVID-19)***. I always ask questions and provide constructive feedback when students are doing hands-on learning. I believe in a critical thinking analysis approach, planning individual experiments

and interpretation based on the evidence play a big role in students' learning. I bring industry-based experience while teaching labs and courses to facilitate meaningful connections between theory and practice. Feedback from students underscores the effectiveness of this method in reinforcing their understanding of the material ***(Appendix 4: BIOTECH 4GP3 2024_ Labs Feedback).*** Additionally, I have introduced Two-Stage Exams (midterms and final exams) at McMaster University, which have been well-received by students as an engaging and interactive learning tool.

iii) Cultivating Confident Learners

To ensure that I will help students become successful learners, I plan to introduce new courses and improve existing ones to keep up with emerging trends in science and technology. My course includes group assignments, activities, discussions and group exam components (midterm and final exams) that play a pivotal role in cultivating confident and successful learners by leveraging the acquired knowledge within a collaborative framework. By working in teams, students not only enhance their ability to communicate effectively and resolve conflicts but also gain exposure to diverse perspectives and approaches. This collaborative environment promotes critical thinking as students collectively analyze problems, devise solutions, and apply theoretical concepts to real-world scenarios. Moreover, group assignments provide opportunities for students to develop leadership skills, delegate tasks, and manage timelines, all of which are essential competencies for academic and professional success. Additionally, my course design incorporates individual work for self-reflection and practice exercises to reinforce learning.

For example, In BIOTECH 2CB3, I introduced group assignments and implemented two-stage midterm and final examinations to promote deeper learning. Student feedback indicates that these activities were well received, as they encouraged students to articulate course concepts in everyday contexts and increased confidence in the knowledge they developed. In addition, participating in small-group projects and giving and receiving peer feedback further strengthens students' confidence. ***(Appendix 5 and 11: Feedback on group exams and group learning activities).***

My teaching philosophy is best summarized as a composite of three tenets that combine my own empirical experience of learning and teaching. First, I guide students through complex biological problems, providing essential concepts that enhance their knowledge expansion within the sciences. Second, I encourage active engagement, prompting students to think critically, explore independently, and connect biological concepts to everyday life, which nurtures their curiosity and deepens their scientific understanding. Lastly, I focus on developing robust learning strategies that students can use in academic and professional settings, empowering them to become confident, adaptive learners equipped to tackle challenges with resilience and proficiency.

4. Teaching Experience: I am teaching at McMaster University since 2019 as a sessional faculty and during this time I designed active based learning curriculum, practical example-based tutorial and labs. ***(Appendix 6 & 11: tutorial and Feedback BIOTECH 2CB3 2025.*** At Northeastern University, I have instructed Foundations in Biotechnology (BIOT5120), Molecular Approaches (BIOT 5750), Biotechnology Applications Lab (BIOT 7245), and I am presently teaching Biotechnology Lab skills BIOT 5145 (Molecular Approaches Biotech) **(Appendix 12).** This experience across diverse academic environments has strengthened my ability to engage students effectively and foster a dynamic learning atmosphere.

5. Teaching Methods and Course Development

My teaching approach integrates diverse strategies tailored to students' backgrounds, course logistics, and objectives. Each course is methodically designed around five key questions that define learning goals, refine assessments, create engaging activities, and align content with students' aspirations and real-world applications. I foster active, collaborative, and authentic learning through brainstorming, discussions, group work, question formulation, and reflective activities. By incorporating real-world topics and case studies, I simulate practical challenges, encouraging students to apply theoretical knowledge, think critically, and solve complex problems while deepening their understanding. Overall, my teaching philosophy is to create a learning environment that is engaging, informative, and directly connected to real-world applications, thereby preparing students to apply their knowledge effectively in their future endeavors ***(Appendix 7: Course outline for BIOTECH 2CB3 2025)***.

6. Professional Development

i) Workshop Participation and Certifications: My professional journey began with TA orientation workshops at York University, enhancing my foundational teaching skills. I've attended over 50 workshops at York and McMaster University to refine various pedagogical techniques. Additionally, I completed the TA Certificate in Teaching (TACT) and the Senior Teaching Assistant (STA) certification, deepening my teaching strategies and earning accolades from York's Director of Natural Science.

ii) Instructional Skills and Mental Health Support: I engaged in the Instructional Skills Workshops (ISW) at both York and McMaster University, focusing on teaching effectiveness through experiential learning. I also completed the Professor Hippo-on-Campus program and Safe Talk training to better support students facing mental health challenges.

iii) Educational Workshop Leadership: I have led numerous workshops at York University, targeting different departmental needs and TA orientations, sharing advanced teaching methods and enhancing the pedagogical skills of peers. The details and impacts of these workshops are documented in ***(Appendix 8)***.

7. Evidence of Teaching/Services Recognition

Over the years my contributions to teaching, leadership and service have been recognized formally. Below is a list of the award/ appreciation emails I have received.

- Richard Jarrell Excellence in Teaching Award (Faculty of Science), York University (2017)
- First place in Teaching Commons STAY symposium, York University (2016)

A sample of emails and feedback from the course/labs from York, McMaster and Northeastern University are compiled and presented in ***(Appendix 9-10)***.

8. Conclusion

My teaching philosophy is grounded in active learning, promoting inclusivity, and the meaningful application of knowledge. By cultivating a supportive and dynamic learning environment, I aim to help students master complex concepts, enhance their critical thinking abilities, and grow into confident, accomplished learners prepared for professional success.