

TEACHING DOSSIER

of

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TEACHING DOSSIER: Dr. Gregory King

1. Brief Biography

I have been developing and refining my classroom teaching and leadership skills throughout a decade of academic and athletics coaching experience. During my BSc and MSc from Carleton University I supported student learning as a teaching assistant in biology and geography disciplines. During my PhD I acted as an instructor at a European field school and while completing my thesis held a part-time faculty position at Mount Allison University. In this position I was the primary instructor for four undergraduate courses including both physical and social sciences in the Department of Geography and the Environment. In my current postdoctoral fellowship at Queen's University, I was the primary instructor for an undergraduate course on the topic of weather and climate in the Department of Geography and Planning. Outside of academia, I am a nationally certified Ultimate Frisbee coach who has used teaching concepts to guide youth, university and adult club teams to various personal and team successes including a national championship with the Queen's Women's Ultimate program.

My teaching experience has primarily involved environmental and physical science courses. I view natural science as a fundamentally hands-on, exploratory pursuit and I would be very interested in developing courses related to my own background in biogeography and forest ecology, along with a field course that would provide an immersive, experiential learning opportunity for students. As outlined in this dossier, I value the process of teaching and enjoy sharing knowledge with students in the classroom and athletes on the field. I look forward to developing my skills further as I pursue my academic career.

2. Teaching Philosophy

My philosophy of teaching is closely linked to my own experiences as a lifelong learner who wakes each day with a sense of fascination for the world. Part of my path toward an academic career was initiated by teachers and mentors who were excited about sharing knowledge; linking knowledge with real-world examples and opportunities for exploration. This helped shape my passion for teaching and a desire to use my teaching as an occasion to connect with students and increase awareness of the world around them.

Research has provided me with opportunities to travel around the world to conduct fieldwork. I aim to translate these experiences into learning opportunities that reveal applications for the concepts I am teaching, through sharing stories and pictures. As I have gathered more experience in the university environment, I have realized the importance of a strong and dynamic link between research and teaching, and how they each inform and improve the other and provide important connections for students. It has become clear to me that linking scientific research with teaching university

students provides an excellent learning environment for both students and their teachers.

My current philosophy of teaching has developed from my experiences as a learner, a teaching assistant and a teacher. There are three key principles that guide my current teaching practice:

1. *Student Engagement to Support Learning*: Engaged students will take more value from a classroom. I aim to provide an environment where I can engage with students of varying disciplines, learning styles, and levels of interest in science to make my courses relevant. I teach with enthusiasm and strive to convey this enthusiasm through the well-designed, memorable and engaging conversation around material. I foster a classroom environment that supports two-way communication and encourages students to be involved in discussions and ask questions of their peers and me. Strategies I have used to encourage these behaviours are small, quick group sessions; subject topic primers; class brainstorming sessions; and being sure to ask well-formulated questions in class. Outside of class I encourage students to visit me during office hours early in the term (i.e. by scheduling appointments and assigning value to the process) to provide another avenue for discussion of course topics and make it more likely for them to return if they have further issues.

2. *Combining Theory and Experience*: Science is a hands-on, collaborative, curiosity-driven field with real-world implications. This view underpins my effort to find an opportunity for every student in my classes to experience this type of science. It is crucial that I have students engage with current and leading-edge information highlighting the scientific process and the relevance outside of the classroom. This allows them to see links between theory and meaningful issues. I view scientific literacy, and more broadly the ability to critically assess information, as an essential skill. I develop and sharpen these skills by providing opportunities for students to read and interpret primary literature as well as include coverage of current issues that involve course content revealing how classroom material impacts students. This goes hand-in-hand with my efforts to bring in guest speakers from outside of academia and to look for opportunities to provide every student with a hands-on experience through labs and field trips.

3. *Multiple Approaches to Assessment*: Understanding the learner's point of view is important for successful teaching. There is a diversity of different learning styles in every community and my teaching demonstrates that I will do my best to provide each student with support in his or her learning goals. My main strategy for providing this support is to use various assessment mechanisms (i.e. writing assignments, oral presentations, laboratory exercises, etc.) in every course, and to not rely solely on written tests and exams to provide marks. Although this approach may require more effort, it allows students to connect with the material and express multiple modes of

understanding. I employ novel teaching approaches, such as the use of collaborative quizzes, flipped classrooms, online discussion groups, or new classroom technology such as interactive polls to increase topic comprehension and peer-learning opportunities. In each course, I also make an attempt to survey students for existing knowledge and topics of interest so that I can tailor learning to subjects that foster involvement and connection. I wish to model an inquisitive, hands-on attitude towards science and demonstrate this by being willing to admit when I don't know an answer and then locating and sharing resources at the next opportunity.

As I have applied these principles to my teaching, I have noticed positive responses from students. However, I am always striving to improve and become a better teacher. To accomplish this, I believe in gathering and considering the results of both summative and formative evaluations of my teaching from both students and peers. To that end I have consistently sought out professional development opportunities centered on teaching and plan to continue doing so in the future.

3. Teaching Experience

3.1 Queen's University: Teaching Responsibilities - Course Instructor

I) GPHY 209: Principles of Hydroclimatology (Winter 2016)

A required second-year course for BSc geography students and an elective for all other geography students, this course had 80 students and involved three one-hour lectures along with a two-hour laboratory each week. The goal of this course was to provide a fundamental understanding, from a scientific basis, of the Earth's weather and climate. Content included physical properties of the atmosphere, radiation and energy balances, global circulation, atmospheric moisture and precipitation, weather systems, weather forecasting, the world's climates and the mechanisms of climate change on various scales. Special focus was placed on how processes in the atmosphere and hydrosphere operate, interact, and influence essential but often-overlooked aspects of our lives. Assessment included biweekly collaborative quizzes, a final exam, three-minute thesis-style presentations, and laboratory reports. I designed all course material and gave all lectures while TAs led labs. See Appendix for syllabus.

3.2 Mount Allison University: Teaching Responsibilities - Course Instructor

I) GENS 3421: Biogeography (Fall 2013)

An elective third-year course for 23 students enrolled in Biology, Environmental Science and Geography. The course involved three one-hour classes each week over a 13-week period. Course content explored the geographic distribution of living organisms and the driving factors behind these distributions. Topics discussed include hierarchies of organizing organisms, disturbance, dispersal, extinction, and links between biogeography and conservation. Material was delivered with traditional lectures, but also included small-group discussion of primary literature accompanied by short written synopses. Additionally, two labs were designed and provided that required students to apply theory learned in the classroom. Assessment included tests, written assignments and presentations.

II) GENS 2421: Weather & Climate (Winter 2014)

In this required course for all Geography and Environmental Science programs, 75 students were engaged with two 1.5-hour lectures and one 1.5-hour laboratory session each week. The course focused on the meteorological processes that impact our daily lives and combine to form long-term, climatic trends. Content included atmospheric composition, energy balances, air masses, precipitation processes, synoptic storm formation, and the Earth's climates. A special focus was placed on understanding climate in the context of anthropogenic-influenced warming. Material was delivered through lectures involving class interaction, and labs that applied theory presented in class. Assessment included written tests,

laboratory reports and participation both in class and via an online class forum. I gave all the lectures, and labs were led by a lab instructor with whom I worked collaboratively to design material. I was present during most lab sessions to help with questions.

III) GENV 2001: Contemporary Environmental Studies (Winter 2014)

A multi-disciplinary course that examined society's relationship with the environment. 40 students from faculties across the university (this course had no pre-requisites) were led in two 90-minute lectures each week. The course was split into two parts, with the first introducing essential framework topics such as spheres of the earth, environmental philosophy, the role of science, and the history of environmentalism. The second part of the course was issue-based, with topics such as human population and urbanization, energy systems, climate change, green marketing, and food and water systems. This class was focused on fostering student involvement in all aspects of the course. Small-group discussions were often the starting point, leading to sharing with the broader class. There was no textbook, with material instead taken directly from news headlines and scientific primary and secondary literature. Student assessment included writing assignments, presenting news stories linked to the environment, engaging in debate about issues, making presentations, completing a mid-term and a final exam, and crafting a final paper that was broken into stages over the course of the semester. See Appendix for syllabus.

IV) GENS 4231: Tantramar Wetlands Ecology (Winter 2014)

I acted as the advisor for an independent study course in which three students investigated data from the Tantramar Wetlands Centre near the campus. The course involved each student selecting a topic and appropriate data, designing their own syllabus, and completing a written report as well as a deliverable for the Wetlands Centre (in the form of a poster, map or presentation). My involvement was to provide guidance regarding research questions and provide feedback on material, as well as to provide a final assessment. Weekly meetings were held with each student to discuss progress and set goals.

3.3 Swiss Federal Research Institute: Teaching Responsibilities - Course Instructor

I) European Dendroecological Fieldweek (2011)

I participated, with a team of researchers from my scientific institute, in the planning and execution of a fieldweek course for a group of 20 international students at various levels, ranging from master's to postdoctoral fellows. The course was designed to introduce students to the field of dendroecology, providing a general overview of topics through lectures, but

also allowing students to choose a project, work on it, and present results at the end of the week. In my role, I provided a lecture on my topic (monitoring intra-annual tree growth) and then acted as a co-leader of a small group who worked to establish a research question, collect data, process data and interpret results. This required a combination of one-on-one and small-group supervision and interaction.

3.4 Carleton University: Guest Lecture Experiences

Winter 2008 - GEOG 1010B: Global Environmental Systems

- Glaciers and glacial/periglacial landforms

Fall 2005 - BIOL 2002: Plants: Form and Function (Fall 2005)

- Plant primary and secondary meristems

3.5 Carleton University: Teaching Assistant Experiences

Winter 2008 - GEOG 3105: Climate and Atmospheric Change

Fall 2007 - GEOG 1010: Global Environmental Systems

Winter 2007 - GEOG 3103: Watershed Hydrology

Fall 2006 - GEOG 1010: Global Environmental Systems

Fall 2005 - BIOL 2002: Plants Form and Function

- Held two positions, marker for lecture requirements and laboratory TA position

3.6 High-Level Coaching

Outside of academia I have been involved for over a decade with leadership and coaching of Ultimate Frisbee. Under the National Coaching Certification Program (NCCP) from the Coaching Association of Canada I became the second fully trained and certified Ultimate coach in Canada. I have coached at levels ranging from youth and juniors focused on introduction of the sport to working with university students and adults in a competitive sports environment. The parallels between coaching and university teaching are numerous and my successes on the field have directly informed my approaches in the classroom. As the head coach of the Women's Ultimate program at Queen's University in 2016 the team won the Canadian University Ultimate Championships.

4. Evidence of Teaching Effectiveness

4.1 Formal Student Evaluations - Queen's University

The following table presents scores from questions posed through the University Survey of Student Assessment of Teaching (USAT) that are collected through university standard forms and are based on a scale of 1 (Strongly Disagree) to 5 (Strongly Agree).

Statement	Course	Course Mean	Departmental Mean
1. Overall, this instructor is an effective teacher.	GPHY 209 Winter 2016	4.6/5	3.9/5
2. The instructor seemed genuinely interested in the course material.	GPHY 209 Winter 2016	4.7/5	NA
3. My interest in the subject has been stimulated by this course.	GPHY 209 Winter 2016	4.1/5	3.6/5
4. The instructor showed sensitivity to the needs and interests of students from diverse groups	GPHY 209 Winter 2016	4.6/5	4.1/5

4.2 Formal Student Evaluations - Mount Allison University

The following summary university course evaluation scores are collected through standard forms and are based on a scale of 1 (Strongly Disagree) to 5 (Strongly Agree).

Statement	Course	Course Mean
1. The teacher seemed enthusiastic about teaching the course	GENS 2421 Winter 2014	4.81/5
	GENV 2001 Winter 2014	4.89/5
	GENS 3421 Fall 2013	4.86/5
2. Overall, this person performs effectively as a university teacher.	GENS 2421 Winter 2014	4.57/5
	GENV 2001 Winter 2014	4.89/5
	GENS 3421 Fall 2013	4.95/5
3. The teacher encouraged students to share their own ideas and to ask questions.	GENS 2421 Winter 2014	4.72/5
	GENV 2001 Winter 2014	4.94/5
	GENS 3421 Fall 2013	4.86/5
4. The instructor helped develop an interest in the subject matter	GENS 2421 Winter 2014	4.12/5
	GENS 2421 Winter 2014	NA
	GENS 2421 Winter 2014	4.73/5

4.3 Informal Student Evaluations: Representative Student Comments

Student Engagement to Support Learning:

- "He is very engaged and consistently asks the class for contributions."
- "Dr. King is an extremely enthusiastic teacher and his passion really comes through when he teaches."
- "He is always well spoken and on top of his lectures ... it is obvious he puts a lot of effort and cares about his students."
- "I am now strongly considering a minor in geography. Greg's excitement was contagious and class was interesting."
-

Combining Theory and Experience:

- "Relevant assignments that reflect skills required for science work"
- "Presented very complex topics in a way that everyone could understand and apply on a daily basis."
- "I liked that the labs are relatively interactive, where we get to learn by doing."
- "He relates everything we are learning to the world around us. This course has stimulated my interest to learn more about weather and climate. "

Multiple Approaches to Assessment:

- "Interactive ... Material often presented in many ways, and I especially liked the use of videos."
- "I like the way quizzes are done both individually and as a group, and I think Prof. King is an effective and engaging leader."
- "I really appreciate his eagerness to help students."
- "When Prof. King realized that he presented something unclearly, he was never too proud to correct himself!"

5. Curriculum Development

I) Course Design:

GPHY 209: Principles of Hydroclimatology: Updated curriculum developed for GENS 2421 with more focus placed on larger-scale synoptic climate and also re-designed four labs for the course to be more applicable to the facilities available at Queen's, including student collection of environmental data and snow surveys.

GENS 3421: Biogeography: Developed course curriculum, including course content (lecture slides, selecting readings, etc.) as well as two lab exercises involving tree species identification and distribution and island biogeography that could be conducted within the scope of the course.

GENS 2421: Weather & Climate: Using resources provided by previous course instructor, re-designed course content and redeveloped 2 of 8 labs

conducted as part of the course in conjunction with lab coordinator.

GENV 2001: Contemporary Environmental Studies: Designed course using a new structure that involved introducing framework principles in first half of the course and then selecting topical environmental issues that would be examined using the established framework. Aim was to provide an inter-disciplinary lens that combined physical and social sciences.

II) Teaching Innovations:

- Used concept of collaborative testing that combined individual and group testing. Individuals wrote biweekly quizzes and then were immediately re-tested on the same material in small groups with the goals of immediate feedback and increased comprehension.
- Applied flipped classroom concept to scientific journal articles linked to course topics. Students were assigned a journal article that they read and then wrote a short synopsis about. When synopses were submitted, students gathered in small groups to discuss the article before presenting concepts to the entire class.
- Developed structure for a class debate on an environmental issue (e.g. delivery of oil: pipelines vs. rail) that required students to argue for a specific side of a contentious issue (perhaps not their own), requiring linking content from course, additional research and fully understanding a perspective.
- Lab exercises that require students to create a weather journal through the semester, making observations and applying knowledge from current course topics (i.e. clouds, precipitation, etc.)
- Requiring students to make a three-minute thesis (3MT) style presentation of course material in order to work on public presentations of scientific concepts in a concise and effective manner.

6. Professional Development

Teaching Development Day, Queen's University

- I attended this one-day conference which included interactive sessions aimed to equip participants with new teaching-related skills and perspectives in September 2015 and 2016

Teaching Triangle Program, Mount Allison University

- Participated in this program during fall of 2013 which involved three teaching colleagues and a process of classroom visits, self-reflection, and discussion to reflect on and enhance my own teaching approaches.

7. Appendix

- a. GPHY 209 Syllabus
- b. GENV 2001 Syllabus