Grand-Challenges Curriculum (GCC)

The Grand Challenge Curriculum (GCC) addresses important global issues through a solution-driven, interdisciplinary approach to learning. GCC courses are taught by cross-disciplinary instructors who bring unique perspectives to the Grand Challenge being explored. Each course focuses on a particular global issue while also developing foundational competencies that can be applied across a range of topics.

GCC Courses for Fall 2015

*Please check back as GCC courses continue to be added for 2015–16.*

**GCC 3001  Can We Feed the World Without Destroying It?**

Jason Hill, Assistant Professor of Bioproducts and Biosystems Engineering (CFANS); Resident Fellow of the Institute on the Environment  
David Tilman, Regents Professor of Ecology, Evolution, and Behavior and McKnight Presidential Chair in Ecology (CBS)

This course will seek solutions to the challenge of achieving global food security and sustainability. Ultimately, we will seek to answer the question, “Can we feed the world without destroying it?”

The course begins with lectures and skills workshops, followed by a series of interactive panels with guest experts. We will also prepare group projects that are focused on finding innovative solutions to this grand challenge.

We will learn about the fundamental changes occurring in the global food system, the environment, and our civilization as a whole. We will explore the role of science and technology in informed decision making, how to approach inherently interdisciplinary problems, how to identify solutions that are truly sustainable in the long term, and how to inform the public of our findings.

*GCC 3001 meets Tuesdays, 6–9 p.m., St. Paul Campus. Meets the Environment Theme. 3 credits.*

**GCC 3002  Beyond Atrocity: Political Reconciliation, Collective Memories, and Justice**

Alejandro Baer, Associate Professor of Sociology (CLA); Director of the Center for Holocaust and Genocide Studies  
Catherine Guisan, Visiting Assistant Professor of Political Science (CLA)

This course offers a thorough introduction to the many ways of thinking through the delicate relationship between reconciliatory initiatives, processes of collective remembering, and the requirements of justice.

We will examine theoretical and concrete practices in different historical settings: responses to the Holocaust on the part of victims and victimizers; the Spanish "pact of oblivion" and belated remembering of
the Civil War and the Franco dictatorship; the founding of the European Union between century-old enemy states; the South African experiment in Truth and Reconciliation; and in the United States the American Indian struggles for memory and justice and the Black Redress Movement.

**GCC 3002** meets Tues. & Th, 11:15 a.m.–12:30 p.m., West Bank. Meets the Global Perspectives Theme. 3 credits.

---

**GCC 3004**  
*The New Boom: Promises and Challenges of the Hydrocarbon Renaissance*

Maximiliano Bezada Vierma, Assistant Professor of Earth Sciences (CSE)  
Bruce Braun, Professor of Geography, Environment, and Society (CLA)

This course will explore the energy revolution that has been ignited by recent technological advances (primarily hydro-fracturing or “fracking”) and its many far-reaching consequences. Students will engage in understanding the economic, political, geological, environmental, and social aspects of this multi-faceted issue.

The course will begin with an overview of the economics and geopolitics of hydrocarbons: We will discuss their role in the development of prosperity, the dynamics between major producers and consumers, and the issue of global greenhouse gas emissions. After establishing the historical framework, we will discuss how the “fracking boom” has drastically altered this landscape. To understand where oil and gas comes from, we will cover the basics of petroleum geology and the differences between traditional and unconventional reserves, with an emphasis on “shale gas” and “shale oil.” With a solid understanding of the role of hydrocarbons in the modern world, we will explore the promise and the perils of the fracking boom.

While we will discuss all the major fracking areas, the Bakken Shale will receive special attention both because of its geographical proximity to Minnesota and because of the dramatic transformation it has spurred in North Dakota. We will explore economic and social repercussions of the Bakken boom from the interpersonal to the international, as well as issues related to environmental degradation and other potential hazards. Finally, we will touch on how fracking affects regions not directly involved in hydrocarbon exploitation, focusing on Minnesota. Issues surrounding “frac sand” mining and the transportation of crude oil through the state by pipelines and trains will be discussed. Throughout the course, we will engage students in reading and discussing relevant news articles, as well as viewing and critiquing documentary films. Invited speakers will provide unique perspectives on key issues.

**GCC 3004** meets Tues. & Th, 1–2:15 p.m., East Bank. Meets the Environment Theme. 3 credits.

---

**GCC 5003**  
*Seeking Solutions to Global Health Issues*

Cheryl Robertson, Associate Professor of Nursing (AHC); Public Health Nurse; Past Director of International Programs, Center for Victims of Torture  
Mac Farnham, Assistant Professor of Veterinary Medicine (AHC); Adjunct Professor of Public Health

Complex global health problems can often only be addressed through approaches that go beyond traditional health science disciplines. Whether responding to emerging pandemics, food insecurity, maternal mortality, or civil society collapse during conflict, solutions often lie at the interface of animal, environmental, and human health.

In this course, students will examine the fundamental challenges to addressing complex global health problems in the world’s poorest countries. Together, we will seek practical solutions at the nexus of human, animal, and ecological health. While there isn’t a single “right” solution to grand challenges, progress can be made through an interdisciplinary perspective with emphasis on ethical and cultural sensitivity, and on understanding their complexities. This exploration will help students propose realistic actions that could be taken to resolve these issues. This course will help students gain the understanding and skills necessary for
beginning to develop solutions to this grand challenge.

The course will include a series of primers—lectures and discussions on key topics—followed by “knowledge into action” workshops. Students will work in interdisciplinary teams to build upon lectures, discussions, and workshops to propose a well-developed solution to a problem related to the course’s grand challenge. The primers and class discussions will build understanding of key topics for global one health challenges, while the knowledge into action labs will provide supported practice for students to translate understanding of the problem into real-world interventions.

GCC 5003 meets Thursdays, 1:25–4:25 p.m., East Bank. Meets the Global Perspectives Theme. 3 credits.

GCC 5005  Global Venture Design—What Impact Will You Make?
Julian Marshall, Associate Professor of Civil, Environment, and Geo-Engineering (CSE)
Fred Anthony Rose, Instructor and director of Acara, Institute on the Environment

Addressing many of the world’s most pressing environmental and social challenges requires not only an idea, but a plan to establish a scalable solution. In this project-based course, multidisciplinary teams design venture solutions to global grand challenges related to environment, health and development. For example, teams may address a challenge related to water supply, energy availability, food/agriculture production, waste management, or public health. This Fall, teams will identify a specific challenge in India, design a product or service, and create a financially viable and impactful business solution. Professionals and experts based in the US and India will mentor each team. By the end of the class students have a well-designed venture plan and may pitch for funding to launch their solutions. This course is part of the Acara impact entrepreneurship program.

GCC 5005 meets Fridays, 9 a.m.–12 noon, East Bank. Meets the Global Perspectives Theme. 3 credits.

Please check back as additional GCC courses continue to be added for 2015–16.

About the Grand Challenges Curriculum

Expanded grand challenges research and curriculum is one of four goals of the Strategic Plan for the Twin Cities Campus, which is aimed at building a more agile, more integrated, and deeply engaged research university.

The ten-year plan intensifies the University of Minnesota’s commitment to solving “grand challenges”—the most complex and pressing problems of our state and world.

The Office for Undergraduate Education is collaborating with deans and faculty to develop a special Grand Challenges curriculum that will enhance learning and career pathways for students, and enable them to develop the knowledge, skills, and values needed to address these compelling topics.

For more information about the Strategic Plan, visit strategic-planning.umn.edu.