

Seminar: Innovations at the Food-Energy-Water Nexus

Course Syllabus

Fall 2017 – 1 credit

ST: Food-Energy-Water Nexus Seminar

NRSM 595 (CRN# 74637); GEO 595 (CRN# 74766)

Monday 4:30-5:20pm

Stone Hall 304

Instructor Info

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Office Hours by appointment

Course Description

Food production, water use and conservation, and energy production and use are inextricably linked. For example, “[a]griculture is the largest consumer of the world’s freshwater resources, and more than one-quarter of the energy used globally is expended on food production and supply” ([UN Water, 2017](#)). According to the United Nations, demands for food, energy and water are simultaneously and rapidly increasing, driven by rises in population, affluence, changing global diets and general economic growth. Often separated for economic evaluation and regulatory efficiency, the food, energy and water ‘sectors’ alone are explicitly linked to more than half of the [UN Sustainable Development Goals](#). Actions in the individual sectors of food, energy or water have resounding impacts across all three, creating the need for a holistic and comprehensive approach to research, analysis and management across sectors and across disciplines. Scholarship and practice at the food-energy-water “nexus” embodies such an approach. This seminar convenes a group of faculty, research professionals and practitioners working across boundaries to expose students to contemporary research and management challenges at the nexus. Students will gain a better understanding of what it means to pursue disciplinary and interdisciplinary research at the food-energy-water nexus and will be actively encouraged to explore potential for nexus research in their own graduate studies. Students will also be exposed to several practical skill development topics, including seminars on interdisciplinary research and science communication skills.

Course Logistics, Attendance Policies, and Evaluation Methods

This seminar meets once per week for 50 minutes beginning Monday September 11th. Course grading is on a “credit/no credit” scale. Your performance in the course will be assessed based on your attendance, attentiveness, participation in discussion groups (October 23rd and December 11th), and the completion of two (2) reflection papers throughout the semester. Please note that attendance and participation at each class meeting is highly encouraged, **to received credit for this course, students must at a minimum:**

1. Attend 12 of the 14 class meetings during the semester;
2. Participate in at least 1 discussion group class period (October 23rd and December 11th);
3. Participate in seminar by engaging guest speakers with questions, observations or additional dialogue on the material presented and related ideas; and
4. Submit 2 reflection papers on material presented in the seminar and in the accompanying readings (details below).

I will take attendance each day in class. The only exception to the attendance policy in this course is if a student has a documented University approved absence. In this case, students need to email me at least one week (7 days) prior to the seminar they will miss. The UM “Class Attendance/Absence Policy” can be found in the [*UM Catalog \(2016-2017\) Academic Policies and Procedures*](#).

Respect, Inclusiveness and Diversity of Thoughts, Ideas and People

In teaching courses, I believe and act upon the idea that all students are entitled to and deserve respect, courtesy and tolerance, regardless of their race, ethnicity, background, religious affiliation, gender, sexual preference, disability or any other perceived difference. Likewise, faculty, staff, guest speakers and fellow students deserve the same treatment from other students. Therefore, within the bounds of my courses and professional responsibilities as a university instructor, I make every effort to promote and create a safe space for diverse thoughts, regardless of the form of communication. I ask that you do the same.

Given the broad range of speakers and topics presented in this seminar, showing respect for others is paramount and is taken very seriously. We will strive towards an engaging, respectful and open forum in which numerous opinions related to the course material can be discussed and explored.

Equal Access

The University of Montana assures equal access to instruction through collaboration between students with disabilities, instructors and [*Disability Services for Students*](#) (DSS). If you have a disability that adversely affects your academic performance, and you have not already registered with Disability Services, please contact Disability Services in Lommasson Center 154

or by calling 406.243.2243. I will work with you and Disability Services to provide an appropriate modification.

Student Conduct

All students must practice academic honesty. Academic misconduct is subject to an academic penalty by the course instructor and/or a disciplinary sanction by the University. All students need to be familiar with the [Student Conduct Code](#).

Course Withdrawal Deadlines

Important Dates Restricting Opportunities to Drop a Course Autumn 2017:

Deadline	Description	Date
To 15 th instructional day	Students can drop classes on CyberBear with refund & no "W" on Transcript	Sept 21 = last day
16 th to 45 th instructional day	A class drop requires a form with instructor and advisor signature, a \$10 fee from registrar's office, student will receive a 'W' on transcript, no refund.	Sept 22 through Nov 2
Beginning 46 th instructional day	Students are only allowed to drop a class under very limited and unusual circumstances. Not doing well in the class, deciding you are concerned about how the class grade might affect your GPA, deciding you did not want to take the class after all, and similar reasons are not among those limited and unusual circumstances. If you want to drop the class for these sorts of reasons, make sure you do so by the end of the 45 th instructional day of the semester. Requests to drop must be signed by the instructor, advisor, and Associate Dean (in that order) so if you pursue this request, leave sufficient time to schedule meetings with each of these individuals (generally this will take at least 3-5 working days). A \$10 fee applies if approved. Instructor must indicate whether the individual is Passing or Failing the class at the time of request.	Nov 3 – Dec 12

Required Readings & Reflection Essays

Students are required to complete a reading for each week of class with the exception of the first (September 11th) and the last week of seminar (December 11th). In addition, students will be asked to submit two (2) "reflection essays" of 1-2 pages each, singled-spaced. These will be due at the outset of the discussion period seminars (**October 23rd** and **December 11th**). Writing prompts for these reflection essays will be provided at least two weeks in advance both in class and on Moodle. In general, students will be asked to demonstrate their ability to think critically

about the material presented in class and in the course readings and relate the the material to their own research and scholarship at UM and beyond.

Tentative Seminar Schedule

**All class topics and speakers subject to change.*

September 11: **Get to know the seminar group—you, the FEW, and the future of humanity!**

September 18: **Renewable Energy: Global and Montana Perspectives.** Diana Maneta, Renewable Energy Professional

- Readings: (1) [Wind power costs could drop 50%. Solar PV could provide up to 50% of global power. Damn.](#) (David Roberts, Grist, 8/31/17); (2) [The national debate unfolding over PURPA and solar power](#) (Chris Warren, Greentech Media, 8/28/17)

September 25: **Interdisciplinary Research and the FEW Nexus.** Laurie Yung, Professor, UM Department of Society & Conservation

- Reading: TBD

October 2: **The Nuclear Nexus: An Atomic Perspective on the Food-Energy Water-Nexus.**

Payton Gardner, Assistant Professor, UM Department of Geosciences

- Reading: Hendry, M.J., Solomon, D.K., Person, M., Wassenaar, L.I., Gardner, W.P., Clark, I.D., Mayer, K.U., Kunimaru, T., Nakata, K. and Hasegawa, T., 2015. Can argillaceous formations isolate nuclear waste? Insights from isotopic, noble gas, and geochemical profiles. *Geofluids* 15(3): 381-386.

October 9: **Water and the FEW Nexus.** Speaker TBD.

- Reading: TBD

October 16: **Food and the Nexus in Practice.** David and Randy Mannix, Ranchers, Owners/Operators, Mannix Beef. Convener: Neva Hassanein, Professor, UM Department of Environmental Studies

- Reading: [A Rancher and a Conservationist Forge an Unlikely Alliance](#)

October 23: **Discussion Groups on the Role of the Nexus in shaping FEW Research.** Convener: Chaffin

- Reading: Biggs, E.M., Bruce, E., Boruff, B., Duncan, J.M., Horsley, J., Pauli, N., McNeill, K., Neef, A., Van Ogtrop, F., Curnow, J. and Haworth, B., 2015. Sustainable development and the water–energy–food nexus: A perspective on livelihoods. *Environmental Science & Policy* 54: 389-397.

October 30: **Engineering Perspectives on the FEW: Increasing regional to global-scale resilience in Food-Energy-Water systems through coordinated management, technology and institutions.** Jennifer Adam, Associate Professor of Engineering, Washington State University

- Reading: TBD

November 6: **The Future of Dams Project: How to Approach Interdisciplinary INFEWS Research.** Kevin Gardner, Professor of Civil and Environmental Engineering, University of New Hampshire

- Reading: TBD

November 13: **You've heard of STEM right (you better have)? Introducing "STEAM": the naturally coupled world of art and science at the FEW Nexus.** Maryann Bonjorni, Professor, UM School of Art

- Reading: Scheffer, M., M. Baas, and T. K. Bjordam. 2017. Teaching originality? Common habits behind creative production in science and arts. *Ecology and Society* 22(2):29. [Common habits behind creative production in science and arts](#)

November 20: **Science Communication Workshop for research at the Food-Energy-Water Nexus.** Nadia White, Professor, UM Journalism School.

- Reading: TBD

November 27: **Resilience, Governance, and the FEW Nexus.** Brian Chaffin, Assistant Professor, UM Department of Society & Conservation

- Reading: Chaffin, B. C., H. Gosnell, and B. A. Cosens. 2014. A decade of adaptive governance scholarship: synthesis and future directions. *Ecology and Society* 19(3): 56. [A decade of adaptive governance scholarship: synthesis and future directions](#)

December 4: **TBD, Students Choice**

December 11: **Seminar Conclusion: Discussion groups, wrap up, Food-Energy-Water holiday party.** Convener: Chaffin