EMPOWER NRT

PROGRAM OF STUDY

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204 HEROY GEOLOGY LAB | SYRACUSE UNIVERSITY

Program of Study

The Education Model Program on Water-Energy Research (or EMPOWER) is an interdisciplinary graduate program that provides comprehensive professional training in skills needed for diverse careers. The program includes student-centered, "T-shaped" training elements in research and professional development that leverage nationally recognized graduate programs at Syracuse University in communication (Newhouse School), public policy (Maxwell School), management (Whitman School), and law (College of Law).

Graduates of this program are likely to pursue careers in four sectors: business/industry, government, not-for-profits, or academia, each requiring particular specialized professional skills. The EMPOWER educational program combines broad training across management, policy, communication, and law, with the flexibility of participants to pursue coursework tailored to their own self-identified career trajectory.

The key features of EMPOWER are:

1) Graduate-level research at the water-energy interface
2) Training in science communication
3) Interdisciplinary coursework
4) Professional mentoring opportunities
5) Seed grant program
6) Field experiences

The table below outlines the suggested program of study. Please note that the exact program of study will be determined individually in consultation with your advisor and the EMPOWER Academic Programs Committee. Details on each training element listed in the program of study are provided in subsequent sections.

	PhD Trainees	MS Trainees
AY1	Water-energy seminar (F, Sp.) Start PDSA[1] coursework Science Communication Training Field Experience(optional)	Water-energy seminar (F, Sp.) Complete PDSA coursework Science Communication Training Field Experience(optional)
AY2	Water-energy seminar (F, Sp.) Complete PDSA coursework Field Experience (optional)	Career Pathway Experience Water-energy seminar (optional) Field Experience (optional)
AY3	Career Pathway Experience Water-energy seminar (optional)	
AY4	Complete dissertation research	

[1]Professional Development Specialization Area coursework

Any time during the program of study, PhD and MS trainees may apply for seed grant funding to support professional development training, career pathway experiences, and/or emerging lines of research coupled to professional career interests.

Required Training Elements

1) Water-energy seminar. This seminar is a 1-credit course that features current research in science and engineering at the interface of water and energy, as well as professional development training. The seminar provides a forum for faculty and students from across the disciplines to learn more about and discuss current research in areas of mutual interest, to network with visiting professionals, and to get to know others working in water- and energy-related fields. The seminar is integrated with a visiting lecture series. The seminar is offered every semester and is open to all STEM graduate students at Syracuse University.

MS trainees are required to enroll in the seminar for at least two semesters, ideally during their first year of study. PhD trainees are required to enroll in the seminar for at least four semesters, ideally during their first two years of study.

2) Professional Development Specialization Area (PDSA). The Professional Development Specialization Area (PDSA) provides focused coursework tailored to an individuals' self-identified career trajectory. The PDSA is designed to (1) foster the development of transferrable professional skills; (2) provide training that prepares students for multiple career paths; and (3) help trainees translate and communicate their research to inform a range of stakeholders. The PDSA coursework is intended to add breadth to the scope of coursework required of traditional, disciplinary-specific graduate programs. The PDSA is designed in consultation with the student's graduate advisor, the EMPOWER Program Director, and the EMPOWER Program Manager.

PhD trainees will complete 12 credit hours of study to satisfy the PDSA requirement; MS trainees complete 6 credit hours.

In addition to courses available through Syracuse University and SUNY ESF, the following other training elements may be counted towards the PDSA credit requirements:

1) Science Communication Course Selection (3 credits; see item #3)
2) Domestic Field Experience (3 credits; see below under "Optional Training Elements")
3) International Field Experience (3 credits; see below under "Optional Training Elements")

Note: Trainees that are supported on an NRT Fellowship have 30 hours of tuition credits for the 12-month period for which they receive a stipend (12+12+6 in Fall, Spring, and Summer, respectively). The trainees are encouraged to make wise use of the tuition credit to ensure that they have accumulated the credit hours required by their academic department for their degree, as well as by the EMPOWER program. It is at the discretion of the individual academic departments to what extent professional development coursework required by the EMPOWER NRT will count towards department credit hour and coursework degree requirements.

Trainees are expected to work closely with their advisor, advisory committee, and the EMPOWER Program Director and Program Manager to outline their course of study, ensuring that it meets the needs of their home department and the EMPOWER NRT.

3) **Science Communication Course (3 cr.).** Science Communication Training will develop the oral and written communications skills desired by employers in academic and non-academic careers. All trainees are required to complete this training and it will count towards the PDSA requirement. Please review your options and progress with the Program Manager during Year 1 of your EMPOWER participation.

4) Career Pathway Experience. Trainees will focus on a particular aspect of their research interests that integrates professional development in support of their career goals. The goals of the career pathway experience are to (1) foster the development of transferrable professional skills; (2) provide mentoring from professionals external to the institution; and (3) develop student's technical and professional skills. Ideally the student will have the opportunity to spend a significant amount of time collaborating with professionals at an internship, a field site abroad, a national research lab, a not-for-profit agency, or another university. The career pathway experience will be developed in consultation with the EMPOWER Program Manager and Program Director, as well as with the student's advisor.

Optional Training Elements

1) Domestic and International Field Experiences. EMPOWER offers a two-course field program in the northeastern U.S. and Rwanda that integrates the EMPOWER research themes. Field research conducted by an interdisciplinary team under challenging conditions is a unifying capstone experience, and especially useful preparation for careers requiring intensive collaboration.

~~*Domestic Field Course:* Trainees will have the option to enroll in a regional field course that capitalizes on local resources and active research by faculty in (1) the Devonian Shale Basin of NY and PA; (2) the meromictic Fayetteville Green Lake, NY; and (3) experimental watershed research areas at the Hubbard Brook Experimental Forest, NH.~~ This Option is No Longer Available. Second and Final Domestic Field Course occurred August 2019.

International Field Course: Trainees will have the option to participate in a 3-week international field program in the East African Rift Valley, where they will investigate a full-scale "shale basin" in the process of formation, as well as unique energy systems of the developing world. At Lake Kivu in Rwanda, which is one of the large lakes of the African Great Rift Valley, trainees will study processes of organic matter deposition and hydrocarbon formation, commercial-scale water column methane extraction, and other developing world energy solutions.

Each field course is 3 credits and can count toward the PDSA credit requirements.

2) Seed Grant Program. Trainees are eligible to apply for small grants to support specific lines of emerging research and professional development activities not supported by traditional research grants or assistantships. Funds may support travel, conference registration, supplies, or other direct costs that are related to the EMPOWER goals. Information on how to apply for seed grants is posted on the program website.

Additional Program Expectations

EMPOWER Trainee Orientation: A new student orientation program at the start of the fall semester is offered to (1) foster a sense of community among the EMPOWER trainees; (2) introduce trainees to the EMPOWER program; and (3) build mentoring relationships. The orientation includes an overview of the program, community-building activities, and initiation of advisor-student and peer-to-peer mentoring relationships. Incoming NRT trainees are paired with existing NRT trainees to promote peer-to-peer mentoring.

EMPOWER Program Participation: NRT trainees are expected to participate to the greatest extent possible in all EMPOWER workshops and events. We host 3-4 events per semester for trainees, which will focus on topics related to program administration, professional development, and technical training.

EMPOWER Annual Reports and Advising Meetings: EMPOWER trainees complete annual reports of progress that are integrated with annual advisory meetings. The goals of the annual reporting process are (1) to create a formal structure for regular discussion of student accomplishments and goals; (2) provide formative assessment of student progress in EMPOWER; and (3) solicit feedback on the success of the training program. Trainees complete a standard annual report outlining their progress, which is then reviewed with the Program Director and Program Manager at an annual meeting.

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