Bioenergy Master's degree sequence

The Department of Biological Sciences at Illinois State University has both a Ph.D. program and a Master's degree program in which students can perform thesis research on bioenergy-related projects. For students interested in taking the Master's degree tract, the Department of Biological Sciences offers an M.S. sequence in Bioenergy Sciences, which provides students with the background to conduct thesis research focusing on questions related to biological and/or environmental aspects of using/engineering plants and microbes for the production of bio-based fuels. Ultimately, students will be prepared for pursuing higher degrees or entering professions related to bioenergy. Students can choose between a biotechnology-based track and an ecology/conservation biology-based track. Students in each track are required to take two core courses (BSC365 Bioenergy Plant/Microbe Biology and the Environment, 3 cr.; and BSC420.38 Seminar in Bioenergy Sciences, 1 cr. These courses foster interactions among the sub-disciplines and provide students with a broad educational background for understanding important issues related to the development of bioenergy-related plants and microbes and managing their use and release into the environment.

The Bioenergy Sciences MS sequence is an integral part of the College of Arts and Sciences' Energy Science and Education Program of Excellence (Energy Science PoE). The Energy Science PoE is an interdisciplinary campus-wide program involving participants from the Departments of Biological Sciences, Chemistry, Geography-Geology, Physics, Health Sciences, and Agriculture. The Energy Sciences PoE provides students with both graduate and undergraduate Energy Science-related research and education training in preparation for the growing number of Energy Science-related jobs in Illinois and beyond.

Course offerings for the Bioenergy Sciences MS sequence are as follows:

Biotechnology Bioenergy Sciences track
Required courses (23 credits total):
BSC365 Bioenergy Plant/Microbe Biology and the Environment (3 cr.)
BSC353 Biotechnology Lab I (3 cr.)
BSC354 Biotechnology Lab II (3 cr.)
BSC415 Advanced Cell Biology (3 cr.) or BSC466 Microbial Physiology (3 cr.)
BSC419 Mol. Biol. of the Gene (4 cr.) or BSC 467 Microbial Genetics (4 cr.)
BSC450 Issues in Biotechnology (2 cr.)
BSC420.38 Seminar in Bioenergy Sciences (1 cr.)
BSC499 Thesis Research (4 cr. total)
Elective courses (7 credits total):
Students can choose among graduate level courses either within the Department of Biological Sciences or in other departments. Courses from other departments should include content that is pertinent to the energy sciences (eg. CHE 380.19 Modern Electrochemistry; GEO 341 Climate and Global Environmental Change; AGR355 Plant Biotechnology and Breeding; AGR 356, Plant Propogation; new energy-related courses are being developed in participating Energy Science PoE departments).

Ecology/Conservation Bioenergy Sciences track
Required courses (22 or 23 credits total):
BSC365 Bioenergy Plant/Microbe Biology and the Environment (3 cr.)
BSC404 Population Ecology (4 cr.) or BSC405 Community Ecology (4 cr.)
BSC406 Conservation Biology (3 cr.) or BSC337 Restoration Ecology (4 cr.)
BSC471 Evolutionary Population Genetics (3 cr.)
BSC490 Biostatistics (3 cr.)
BSC420.27 Biostatistics Lab. (1 cr.; taken concurrently with BSC490)
BSC420.38 Seminar in Bioenergy Sciences (1 cr.)
BSC499 Thesis Research (4 cr. total)
Elective courses (7 or 8 credits total):
Students can choose among graduate level courses either within the Department of Biological Sciences or in other departments. Courses from other departments should include energy science-related content (see above).