Approved Program of Study for Undergraduate Minors
Georgia Institute of Technology
Office of the Registrar
2015-2016
Minor in Energy Systems
(Track for Biology Students)

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<th>Name (first/last):</th>
<th>GT Student ID Number:</th>
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<th>Major:</th>
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In addition to the guidelines listed below, you are responsible for reviewing and following the general guidelines for minors: [http://www.catalog.gatech.edu/academic/minorguide.php](http://www.catalog.gatech.edu/academic/minorguide.php)

The minor includes requirements for courses which cut across disciplines. These courses are intended to add breadth of knowledge in areas outside the student’s major but important to energy systems. A terminal “capstone” or project course provides an opportunity for students from multiple disciplines to work together in multidisciplinary teams on a significant project in the energy area.

The breadth courses and the capstone project course, courses taken by all students completing the minor, require one or more pre-requisites; specifically, basic economics, mathematics, and lab science courses. List of required prerequisites and curriculum requirements and options for this minor are on the following pages. The minor must consist of at least 15 hours and all courses in the minor also must be 3000 level and above.

A multidisciplinary or other minor may contain courses in a student’s major field of study. A maximum of 6 semester hours of such courses may be used to satisfy the course requirements for the minor, provided these courses are not also used to satisfy any course requirement in the student's major degree program.

A maximum of 6 semester hours of Special Topics courses may be included in a minor program or the student may complete 3 semester hours of Special Topics and 3 semester hours of either Special Problems or Undergraduate Research. Students may not use 6 semester hours of either Special Problems or Undergraduate Research for a minor.

A maximum of 3 semester hours of transfer credit may be used to satisfy the course requirements for a minor. This includes courses taken at another institution or credit earned through the AP or IB program, assuming the scores meet Georgia Tech minimum standards.

All courses counting toward the minor must be taken on a letter-grade basis and must be completed with a grade of C (2.00) or better.

It is the major advisor’s responsibility to verify that students are using only courses from the designated block(s) from the student’s major field of study that are allowed to satisfy a minor program, that they are not using any Core Area A-E courses (including humanities and social sciences), and that they are not using any courses for more than one minor or certificate. Any free elective course used to satisfy the course requirements of the student’s major degree program may also be used to satisfy the course requirements for a minor.

**List the courses completed for the requested minor:**

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<th>Course and Section</th>
<th>Course Title</th>
<th>Credit Hours</th>
<th>Grade</th>
<th>Semester Completed</th>
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Prerequisite Courses
The prerequisites needed for one or more of the courses required for the minor (breadth courses and the capstone project course) are (all existing courses):

a) Mathematics (MATH 1501, 1502, 2401)
b) Physics (PHYS 2211, 2212)
c) Chemistry (CHEM 1310 or 1211)
d) Economics ECON 2100 or 2101 or (2105 and 2106)

Students ordinarily pursue the minor upon completion of the needed prerequisites. However, the depth course requirements (see below) may be taken as soon as students have met the relevant prerequisites.

Depth Courses
The minor requires six hours of depth courses related to energy systems. A list of acceptable courses which meet the depth requirement is provided by each major approving the minor. Depth courses may be taken in the student’s major to ensure the depth in that major needed to pursue a multidisciplinary minor. All acceptable depth courses must be consistent with the goals of the minor. Examples of acceptable courses include science courses which cover energy science like biomass or other relevant basic science.

Menus of Depth Courses by Program
The Depth Courses below may have additional prerequisites; please check http://www.catalog.gatech.edu/courses/index.php to view the current prerequisites.

Biology
BIOL 4221 Biological Oceanography
BIOL 4410 Microbial Ecology
BIOL 4418 Microbial Physiology
BIOL 4440 Plant Physiology
CHEM 3511 Survey of Biochemistry
CHEM 4511 Biochemistry I
CHEM 4512 Biochemistry II
EAS 4410 Climate and Global Change
EAS 3110 Energy, the Environment, and Society

Breadth Courses
The minor requires six hours of breadth courses (two courses). Students should strive to complete the necessary prerequisites and the depth courses prior to enrolling in the breadth courses. However, depth courses may be taken concurrently with the courses taken to meet the breadth requirement.

- ME 3700  Introduction to Energy Systems Engineering
- ECON 3300  Economics of International Energy Markets
- PUBP 3350  Energy Policy

Capstone Course
GT 4813  Project in Energy Systems

Ordinarily, students must complete all minor requirements before they can register for the Project in Energy Systems course.