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

Please type or print in ink:

Name (first/last):                  GT Student ID Number:

GT Email Address:                  Daytime Phone:

Major:                             Anticipated Graduation Date:

In addition to the guidelines listed below, you are responsible for reviewing and following the general guidelines for minors: http://www.catalog.gatech.edu/academics/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 3 credit hours of Special Topics courses may be included in the minimum 15 credit hours of a minor program and a maximum of 3 credit hours of CHEM 4699 (Independent Research) may be used toward the 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:

<table>
<thead>
<tr>
<th>Course and Section</th>
<th>Course Title</th>
<th>Credit Hours</th>
<th>Grade</th>
<th>Semester Completed</th>
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<thead>
<tr>
<th>Course Code</th>
<th>Course Title</th>
<th>Credits</th>
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<tr>
<td>GT 4813</td>
<td>Project in Energy Systems</td>
<td>3</td>
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Student Signature:

Major School Signature:

Minor School Signature (Management):
Energy Systems  
(Chem and Biochem Track)  
Minor Degree Program

1) Courses at the 1000 level may NOT be used toward the minor.  
2) A maximum of 3 credit hours of Special Topics (in biochemistry) courses may be included in the minimum 15 credit hours of a minor program.  
3) A maximum of 3 credit hours of CHEM 4699 (Independent Research) may be used toward the minor.  
4) All courses counting toward the minor must be completed with an overall average GPA of at least 2.0.  
5) All courses counting toward the minor must be completed with a letter grade basis.  
6) 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.  
7) 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.

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 peruse 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](http://www.catalog.gatech.edu/courses/index.php) to view the current prerequisites.

**Chemistry and Biochemistry**
CHEM 3511 Survey of Biochemistry
CHEM 4113 Inorganic Chemistry - Energy Conversion
CHEM 4XXX/6284 Environmental Analytical Chemistry
CHEM 4XXX/6483 Chemistry of Electronic Materials

**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

Breadth courses may ordinarily serve as technical or free electives in the student’s program of study. However, courses required by name and number and/or used to satisfy Core Areas A through E cannot be used to satisfy the requirements of a minor. All courses in the minor also must be 3000 level and above.

**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.