OVERVIEW

Our interdisciplinary department produces energy and business professionals (EBF), energy engineers (ENENG) environmental systems engineers (ENVSE), mining engineers (MNG E), and petroleum and natural gas engineers (PNG E). We offer a wide range of degree programs, all of which address the effective production, conversion, use and management of energy and mineral resources.

**Vision** We solve the world’s energy problems through high-quality, innovative teaching, research, and service.

**Mission** We are an interdisciplinary, diverse department dedicated to the safe, efficient, and environmentally responsible recovery, processing, and utilization of earth resources.

**Goals** Inspire and motivate students to develop a lifelong attachment to the disciplines in the John and Willie Leone Family Department of Energy and Mineral Engineering (EME), promote learning and discovery in energy and minerals engineering, and create a caring community that inspires faculty, staff, students and alumni.

PURPOSE

This booklet provides basic information about the John and Willie Leone Family Department of Energy and Mineral Engineering (EME), the current EME curriculum, advising, academic procedures, and university policies and procedures. Commonly asked questions are answered in the following pages. Please keep this booklet in a safe place for future reference.

NAME: _____________________________________________________

MAJOR: _____________________________________________________

ACADEMIC ADVISOR: _________________________________________

OFFICE ADDRESS: ____________________________________________

TELEPHONE NUMBER: ________________________________________

EMAIL ADDRESS: _____________________________________________

REGULATIONS SUBJECT TO CHANGE

This manual is informal and not binding to The Pennsylvania State University. Each step of the educational process, from admissions through graduation, requires continuous review and appropriate approval by University officials. Penn State, therefore, reserves the right to change the requirements and regulations contained in this manual and to determine whether a student has satisfactorily met his/her requirements for admissions or graduation.

Penn State is committed to affirmative action, equal opportunity, and the diversity of its workforce. EMS U.Ed. 08-011
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SECTION 1: OUR FAMILY

SOME IMPORTANT NAMES TO REMEMBER

Dr. William Easterling, wee2@psu.edu, Dean, College of Earth and Mineral Sciences (EMS), 116 Deike Building.

Dr. John Hellman, jrh3@psu.edu, Associate Dean for Undergraduate Education, College of EMS, 14 Deike Building.

Dr. Alan Scaroni, aws1@psu.edu, Associate Dean for Graduate Education and Research 248 Deike Building.

Dr. Catherine Lyons, cxl4@psu.edu, Associate Dean Educational Equity, 204 Deike Building.

Dr. Yaw Yeboah, ydy1@psu.edu, Head of the John and Willie Leone Family Department of Energy and Mineral Engineering (EME), Professor of Energy and Mineral Engineering, 118 Hosler Building.

Dr. Mark Klima, msk4@psu.edu, Associate Department Head of EME, Associate Professor, Mineral Processing and Geo-Environmental Engineering, 115 Hosler Building.

Crystal Renaud, cdr125@psu.edu, Undergraduate Staff Assistant, 115 Hosler Building, She is responsible for all student records. Consult her if you have any questions concerning your records, petitions, Co-op, and certification for graduation.

CURRENT FACULTY MEMBERS

Adewumi, Michael, Professor, Petroleum and Natural Gas Engineering and Quentin E. and Louise L. Wood Faculty Fellow in Petroleum and Natural Gas Engineering, m2a@psu.edu

Ayala, Luis, Assistant Professor, Petroleum and Natural Gas Engineering, lfay@psu.edu

Blumsack, Seth, Assistant Professor, Energy Policy and Economics, sab51@psu.edu

Boehman, André, Professor, Fuel Science and Materials Science Engineering, boehman@ems.psu.edu

Briggs, RJ, Assistant Professor, Energy and Environmental Economics, rjb46@psu.edu

Brownson, Jeffrey R. S., Assistant Professor, Energy and Mineral Engineering, Program Officer in Energy and Sustainability Policy. nanomech@psu.edu

Chen, Yongshen, Assistant Professor, Energy and Mineral Engineering, and Virginia S. and Phillip L. Walker. Jr. Faculty Fellow, yzc2@psu.edu

Elsworth, Derek, Professor, Energy and Geo-Environmental Engineering, elsworth@psu.edu
Ertekin, Turgay, Professor, Petroleum and Natural Gas Engineering; George E. Trimble Chair in Earth and Mineral Sciences; and Graduate Program Officer of Petroleum and Mineral Engineering, eur@psu.edu

Eser, Semih, Professor, Energy and Geo-Environmental Engineering; and Undergraduate Program Officer of Energy and Fuels Engineering Option, sxe2@psu.edu

Grayson, R. Larry, Professor, Energy and Mineral Engineering, and George H. Jr. and Anne B. Deike Chair in Mining Engineering, Undergraduate Program Officer, Mining Engineering, rlg19@psu.edu

Groves, William, Associate Professor, Industrial Health and Safety, wag10@psu.edu

Ityokumbul, M. Thaddeus, Associate Professor, Mineral Processing and Geo-Environmental Engineering; and Undergraduate Program Officer of Environmental Systems Engineering, mti1@psu.edu

Karpyn, Zuleima, Associate Professor, Petroleum and Natural Gas Engineering, ztk101@psu.edu

Kleit, Andrew N., Professor, Energy and Environmental Economics and Undergraduate Program Officer of Energy Business and Finance, ank1@psu.edu

Klima, Mark S., Associate Professor, Mineral Processing and Geo-Environmental Engineering, and Associate Department Head, msk4@psu.edu

Lei, Zhen, Assistant Professor, Energy and Environmental Economics, zlei@psu.edu

Li, Li, Assistant Professor, Energy and Mineral Engineering, lili@eme.psu.edu

Lueking, Angela D., Associate Professor, Energy and Geo-Environmental Engineering, lueking@psu.edu

Lvov, Serguei, Professor, Energy and Mineral Engineering and Materials Science Engineering, lvov@essc.psu.edu

Mathews, Jonathan, Assistant Professor, Energy and Mineral Engineering, jpm10@psu.edu

Neito, Antonio, Associate Professor, Energy and Mineral Engineering, and Thomas V. Falkie Faculty Fellow, axn15@psu.edu

Osseo-Asare, Kwadwo, Distinguished Professor, Metals Science and Engineering; and Geo-Environmental Engineering, ako1@psu.edu

Pisupati, Sarma V., Associate Professor, Energy and Mineral Engineering; John T. Ryan Jr. Faculty Fellow, and Undergraduate Program Officer of Energy Engineering, xp17@psu.edu
Radomsky, Mark C., Director and Senior Lecturer, Miner Training Program, mcr4@psu.edu

Radovic, Ljubisa R., Professor, Energy and Mineral Engineering, lrr3@psu.edu

Rostami, Jamal, Assistant Professor, Energy and Mineral Engineering, jur17@psu.edu

Scaroni, Alan, Associate Dean for Graduate Education and Research, and Professor, Energy and Mineral Engineering, aws1@psu.edu

Schobert, Harold H., Professor, Fuel Science, hxs3@psu.edu

Song, Chunshan, Distinguished and Professor of Chemical Engineering, Associate Director of the Penn State Institutes of Energy and the Environment, Professor, Fuel Science; and Director of the EMS Energy Institute, csong@psu.edu

Vander Wal, Randy, Associate Professor of Energy and Mineral Engineering, ruv12@psu.edu

Wang, Yilin, Assistant Professor, Petroleum and Natural Gas Engineering, yilintx@psu.edu

Yeboah, Yaw D., Professor, Energy and Mineral Engineering and Head of the John and Willie Leone Family Department Energy and Mineral Engineering, ydy1@psu.edu

EME Faculty

Michael Adewumi
Luis Ayala
Seth Blumsack
André Boehman
R.J. Briggs
Jeffrey R. S. Brownson
Yongsheng Chen
Derek Elsworth
Turgay Ertekin
Semih Eser
R. Larry Grayson
William Groves
M. Thaddeus Ityokumbul
Zuleima Karpyn
Andrew N. Kleit
Mark S. Klima
Zhen Lei
Li Li
Angela D. Lueking
Serguei Lvov
Jonathan Mathews
Antonio Nieto
Kwadwo Osseo-Asare
Sarma V. Pisupati
Mark C. Radomsky
Ljubisa R. Radovic
Jamal Rostami
Alan W. Scaroni
CURRENT STAFF

Altemus, Rachel, Writer/Editor and Alumni Coordinator, rla7@psu.edu

Andrews, Joan, Administrative Assistant, jxa1@psu.edu

Byers, Robert, Computer Laboratory Supervisor, IT Support Specialist, rab31@psu.edu

Donald, Carole, Receptionist, cld14@psu.edu

Howard, Jennifer, Special Events Coordinator, jxh6@psu.edu

Johnstonbaugh, Kathy, Staff Assistant, Miner Training Program, kfb2@psu.edu

Morrison, Anna, Publications Design Assistant, amm277@psu.edu

Mosesman, Phyllis, Staff Assistant, Graduate Programs, pam9@psu.edu

Motel, Tom, Laboratory Supervisor and Recruiting Coordinator, tjm14@psu.edu

Renaud, Crystal, Staff Assistant, Undergraduate Programs, cdr125@psu.edu

Stem, Michelle, Administrative Assistant, mgs1@psu.edu
SECTION 2: GENERAL INFORMATION PERTAINING TO ALL STUDENTS

YOUR ACADEMIC FILE

Upon admission to one of our programs, an official academic file will be created. This file will contain your academic progress in the department and will be reviewed and updated throughout your academic career. This file can only be removed from the office by your academic advisor.

ADVISING

Every student in the John and Willie Leone Family Department of Energy and Mineral Engineering is assigned an Academic Advisor who is a faculty member in the department. Advisors assist you in planning your academic curriculum and, to a limited degree, will help you in other matters associated with your college career. It is recommended you see your advisor at least once a semester before you schedule your courses. Remember, your academic advisor is here to help you; however, you are ultimately responsible to make sure you have fulfilled all the necessary major requirements prior to graduation.

ACADEMIC PROGRESS

The University defines the conditions under which automatic actions are taken if a student fails to achieve satisfactory academic progress. Corrective actions may require changing study habits, reducing the number of enrolled credits, or disenrollment from the Department until such time as the overall GPA improves.

MINIMUM GRADE POINT AVERAGE (GPA)

To graduate, a student must earn at least a cumulative GPA of 2.00 in all courses taken at Penn State and earn at least a grade of “C” in certain prescribed courses as indicated in the Undergraduate Degree Programs. GPA in the major is computed from all courses required for the major.

DEGREE AUDIT REPORT

You can obtain a current copy of your Degree Audit Report directly by going to http://elion.psu.edu and following the directions to obtain your audit. The audit is prepared by the Registrar, and lists the courses you have completed, the grades you have received, your overall GPA, and the remaining courses that need to be completed. Courses for which you receive a grade of D or a F if the course is a “C” required course must be repeated. Students should meet with their advisors at least once a semester before scheduling their courses for the next semester. Please note that the Degree Audit is a tool to aid you in your progress towards a degree; therefore, it is your responsibility to ensure that you have met all the requirements for your degree. All categories must have a “+” prior to graduation. When meeting with your advisor, please supply a copy of your current Degree Audit for review. Examples of all major degree audits are provided in this handbook.
ADVANCED PLACEMENT CREDITS (AP)

These are credits obtained during your high school career. Coming to college with AP credits frees a lot of room in your schedule, which allows you to move ahead with technical courses and pursue interests such as minors with more freedom and flexibility.

TRANSFER CREDITS FROM ANOTHER UNIVERSITY

Penn State students may elect to schedule courses at another institution and transfer the credits to Penn State to meet degree requirements. Before a student schedules course work at another institution, he/she should have the credits approved for transfer and should work with an advisor to determine how the credits will apply to his/her academic program. A course will be transferable with a grade of C (2.00) or higher. If the student wishes to take courses at another university (for example, during the summer) as a substitution for required Penn State courses, he/she must access the course “evaluation tool” from the Penn State Admissions page. For further information regarding transferring credits visit, http://admissions.psu.edu/academics/credit/transfer. Do not assume that any course will be accepted without first using the “evaluation tool”. Transfer credits are designated either “direct” or “general”. A direct transfer is equivalent of a Penn State course and will appear on your transcript with the Penn State course name. A general transfer may or may not be the equivalent of a Penn State course. You’ll need to review that course with your advisor before enrolling in that course.

PETITIONS AND COURSE SUBSTITUTIONS

The standard curriculum for each major is given in the degree bulletin on the web at http://www.psu.edu/bulletins/bluebook. Substitutions for the required courses may be permitted when the subject matter is equivalent in content level and credits. The evaluation of work done at other institutions or in other programs is made by the department program officer. Students enrolled in the program must request substitutions on a standard petition form before the course is taken. The petition must be approved by the advisor and the program officer for the major. General Education requirements must be approved by the advisor, the program officer, and the Associate Dean for Undergraduate Education of the College. You can obtain a Course Substitution form in 115 Hosler. An example of this form is provided at the end of this handbook.

“3-6-9” Option The usual sequence for General Education requirements is a 6-6-6 sequence – two courses in each of the following areas: Arts (GA), Humanities (GH), and Social Sciences (GS). However, you can elect to do a 3-6-9 sequence by submitting a Course Substitution form.

Senate Petitions Requests to waive any of the University’s procedures must be done through the Associate Dean’s office in 14 Deike. Petitions are commonly used for dropping or adding a course retroactively, and withdrawing from the University retroactively. Each of these situations requires the student to submit a petition in the form of a personal letter and supporting documents addressed to the Senate Committee on Undergraduate Education. For
specific information on submitting this type of petition, a student should see the Associate 
Dean for Undergraduate Education office Administrative Assistant, Martha Traverse, in 14 
Deike.

COURSE CHECK SHEETS

In addition to the official audit report, the EME department maintains a simplified 
Academic Plan to monitor the academic progress of the students. We recommend that you 
maintain an updated copy of your Academic Plan. This is the easiest way to monitor your 
progress and spot any potential problems. Copies of the Academic Plan are found after a 
description of each major in this handbook.

TRANSCRIPTS

Grades are recorded to the student’s transcript approximately 6 days after the last day 
of scheduled final exams. The transcript provides the completed academic record of the 
student. The transcript does not include academic warning or grade point deficiencies if the 
student’s GPA is below 2.00.

PREREQUISITES

Many courses, especially those that cover technical topics, have prerequisite 
requirements that must be completed successfully before a student enrolls for a more 
advanced topic. Prerequisites not only help present course material in a logical order, they are 
also important in building the necessary background that is required to advance to more 
difficult and sophisticated concepts. Students may not be permitted to take a course if they do 
not have the prerequisites.

SCHEDULE CHANGES: DROPPING AND ADDING COURSES

Drop/Add within ten calendar days of the semester
Students may drop or add a course during the first ten calendar days of a semester; 
after the 10th day, a fee will be charged for each drop/add process. Students may not add a 
course to their schedules after the first ten calendar days of the semester unless they receive 
the consent of the instructor on a drop/add form which you can obtain in 115 Hosler.

Late drop
A student may withdraw from a course beginning with the 11th day of a semester and 
ending on the last day of the 12th week. You should consult with your advisor before doing so. 
Dropping a course during this time period is called a “late drop”. A student’s transcript will 
record a “late drop” as withdraw no grade (WN). If a student is taking a course concurrently 
with a prerequisite course, the prerequisite may not be dropped without also dropping the 
course for which it is a prerequisite. A student is granted 16 late drop credits during his/her 
college career. After the 12th week, a student CANNOT “late drop” a course for any reason. 
Students wishing to “late drop” a course can do so through eLion or by taking a drop/add form 
to the registrar. Students who drop a course and carry less than 12 credits are defined as part-
time students and may jeopardize their eligibility for student loans and scholarships. An example of this form is provided at the end of this handbook.

**Administrative Course Cancellation Form**

An administrative course cancellation resolves a registration error and results in the removal of a course (or courses) from the student's academic record. It is appropriate only if the student never attended the class. If this procedure is used, drop or late drop of the course is not necessary. If this procedure results in the cancellation of all courses on a student's current semester schedule, the student must re-enroll to resume degree candidacy. An error may be corrected with this procedure only during the semester or session in which the error occurred or before the end of the next semester. Therefore, the deadline for a course scheduled during the fall semester would be the end of the following spring semester. Summer sessions are ignored when the deadline is determined; the deadline for a course scheduled for the spring semester or any summer session would be the end of the following fall semester. After the administrative course cancellation deadline, a request for the correction of an error must be submitted by petition to the Faculty Senate. No drop/add fee is charged for a correction of the error. If appropriate, tuition is reimbursed for the canceled course. Student aid may be adjusted. Students should contact the Bursar's Office [http://www.bursar.psu.edu](http://www.bursar.psu.edu) and/or the Office of Student Aid [http://www.psu.edu/studentaid](http://www.psu.edu/studentaid) for information. The student needs to go to the department offering the course and request an Administrative Course Cancellation form. The student must complete the student section and sign the "Student Certification" on the form and submit the form to the department office. To ensure that the course was canceled, obtain a corrected copy of your schedule (or grade report from the previous semester) approximately one week after requesting this action. If the course is still listed, seek assistance at the department office. An example of this form is provided at the end of this handbook.

**SCHEDULES: MAXIMUM/MINIMUM CREDIT LOAD**

Students enrolled in the EME department are expected to take the prescribed courses in the major. The advisor may recommend irregular schedules, which are necessary owing to a student’s transfer from another institution with advanced standing, change of major, failure in one or more courses, or extenuating circumstances beyond the student’s control. Any scheduling deficiencies, such as failing a course and/or dropping a course, should be made up as soon as possible to adhere to the standard scheduling of courses and to make sure that all prerequisites have been met.

**Standard Schedule**

Students enrolled in the EME department are expected to follow the assigned course plan. This plan requires students to take between 15-18 credits per semester. A student has the option of taking summer courses; however, it is not mandatory.

**Heavy Schedule exceeding 19 credits**

Students should discuss the need for a heavy schedule with their advisor before getting permission from their advisor to take more than 19 credits. A drop/add form must be filled out and signed by your advisor giving permission to take more than 19 credits. When completed, the Undergraduate Staff Assistant in the department offering the course will add the course to your schedule.
Light Schedule
Under certain circumstances, students may take less than full-time credits. You are considered a part-time student if you are taking less than 12 credits. Please remember taking less than 12 credits will affect your student aid, student loans, and scholarships.

WITHDRAWAL FROM THE UNIVERSITY AND LEAVE OF ABSENCE

A student may withdraw from the University any time up to and including the last day of classes before the final exam period begins. Such a withdrawal applies to all courses being taken. If the student wishes to enroll in classes at a later date, an application for re-enrollment as a degree candidate must be made and must satisfy the degree requirements that existed at the time of the re-enrollment even if these requirements are different from those in effect when the student was admitted to the University.

UNSATISFACTORY SCHOLARSHIP

At the end of each semester, a student’s academic record is reviewed for a grade-point deficiency. A grade-point deficiency exists when the student’s GPA is below 2.00. A student with any grade-point deficiency shall receive academic warning unless drop action is taken under other rules. Academic warning is an official notification to students that they are currently failing to meet the minimum grade-point requirement towards graduation. A student shall be dropped from the University for Unsatisfactory Scholarship at the end of the semester in accordance with the following grade-point deficiencies.

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<th>Total-credits scheduled (cumulative credits)</th>
<th>Grade-point deficiency</th>
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<tbody>
<tr>
<td>24-39</td>
<td>21 or more</td>
</tr>
<tr>
<td>40-69</td>
<td>18 or more</td>
</tr>
<tr>
<td>70-99</td>
<td>15 or more</td>
</tr>
<tr>
<td>100 or more</td>
<td>12 or more</td>
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</tbody>
</table>

These actions shall not apply to students transferring from another institution at the end of their first semester of enrollment and students who have earned a 2.00 average or better in their most recent semester. The actions listed above are taken automatically by the Office of Registrar. In cases of unsatisfactory scholarship, Academic Services will notify student of these actions. The Dean of the College, subject to the review of the faculty of the College, may at any time recommend to the President that a candidate enrolled in that College be dropped as a degree candidate at the University if the candidate is, in the opinion of the faculty, not adaptive to the work of the college.

CREDITS BY EXAMINATION

A student wishing to acquire credits by examination must obtain a “Credit by Examination” form and take it to the Bursar’s Office for payment of the fees before the exam can be administered. Following the exam, the Records Office will record the course number, title, credit, and grade with the notation CPX on the student’s permanent record. Grades of “D”
or lower will not be recorded on the student’s permanent record. Credits by examination may not be attained on a pass-fail basis. Authorization for credit by examination may not be granted for the purpose of acquiring credit for a course previously failed. Credit by examination applies to degree candidates who meet the requirements of the course only.

ATTENDANCE

Class attendance is required for all EME courses. Instructors may include class attendance in calculating final grades.

PROFESSIONALISM AND ACADEMIC INTEGRITY

EME considers academic dishonesty, including cheating and plagiarism, to be a serious offense. If you are unsure what conditions constitute dishonesty, ask your instructor. Dishonest incidents should be reported to the course instructor or to the Department Head who, in turn, will refer it to the College Committee on Academic Integrity. The committee consists of faculty, students, and academic administrators.

CHANGE OF MAJOR

Any student considering a change in major should consult his/her academic advisor and the Program Officer before proceeding. A student desiring to change majors may obtain a Change of Major form and necessary assistance at the Undergraduate Office in the college where the new major resides. Students will be permitted to change from a major in EME to one in another college only with the approval of the Dean of the new college. If the student does not meet the transfer requirement of the new college, the Dean may require them to transfer to the Division of Undergraduate Studies until they meet these transfer requirements. An example of the Change of Major form is provided at the end of this handbook.

INTENT TO GRADUATE

Seniors who will fulfill all the degree requirements by the end of the semester in which they intend to graduate must file the Intent to Graduate form found on e-Lion. This must be done within the first two weeks of the semester in which you are graduating.

MINORS

A minor consists of at least 18 credits that supplement a major. Minors can be obtained in the following programs from this department: EN ENG, ENNEC, GBS, I H S, MNG E. These will be discussed later in this handbook.

FINAL EXAMS AND CONFLICT EXAMS

All courses conclude with a final exam or an alternative end-of-semester evaluation method. Students scheduled for three or more final exams in a 15-hour period may file for a conflict examination with the University Registrar. The form used for filing for a conflict exam
can be found through your account on e-Lion. The final exam schedule can also be viewed on e-Lion.

TOLERANCE, DIVERSITY SUPPORT AND SEXUAL HARASSMENT

The Pennsylvania State University is committed to the policy that all persons shall have equal access to programs, facilities, admission and employment without regard to personal characteristics not related to ability, performance, or qualifications as determined by University policy or by state or federal authorities. It is the policy of the University to maintain an academic and work environment free of discrimination, including harassment. The Pennsylvania State University prohibits discrimination and harassment against any person because of age, ancestry, color, disability or handicap, national origin, race, religious creed, sex, sexual orientation, gender identity or veteran status. Discrimination or harassment against faculty, staff or students will not be tolerated at The Pennsylvania State University.:
http://www.equity.psu.edu/Zero/resources.asp.

WORLD CAMPUS/ ONLINE COURSES

Students often satisfy degree requirements by taking online courses through Penn State’s World Campus. Students may take online courses in any semester in which they are registered. Students must obtain the permission of their advisor to register for more than one World Campus course in a semester. Advisors can email their permission to: wdregistration@outreach.psu.edu Additional information is available online at: www.psu.edu/dus/handbook and go to the world campus link.

INDEPENDENT STUDY COURSES: EGEE 496, ENNEC 496, F SC 496, I H S 496, MNG 496, MIN E 496 AND PNG 496

Students participating in independent study under the supervision of an EME faculty member may satisfy graduation requirements by enrolling in no more than 6 credits of the above courses. Students cannot register for the above courses without having made arrangements with a faculty member and receiving the permission of the student’s advisor. In order to take one of these courses, a form from the Undergraduate Staff Assistant in 115 Hosler Building must be obtained. Upon completion, return the form to 115 Hosler. An example of this form is provided at the end of this handbook.

SPECIAL TOPIC COURSES: EGEE 497, ENNEC 497, F SC 497, I H S 497, MNG 497, AND PNG 497

New or experimental courses will be offered from time to time. The above courses will appear on the student’s transcript with a suffix letter along with the title of the course being offered.

SECTION 3: STUDENT RESOURCES AND OPPORTUNITIES

SCHOLARSHIP INFORMATION
The John and Willie Leone Family Department of Energy and Mineral Engineering offers a wide-variety of scholarship opportunities to undergraduate students pursuing degrees within the department. Students are evaluated based on the criteria of each individual award (i.e. academic merit, financial need, PA residency, etc.). Incoming first-year students are automatically considered for scholarships based on academic merit and financial need. **They do not need to fill out an application form.** Continuing students must complete an application form (with a brief essay) and submit it with a current resume by APRIL 1st to be considered for the following year’s awards. Additional information and application materials can be found online at [http://www.eme.psu.edu/scholarships](http://www.eme.psu.edu/scholarships). Information on other sources of financial aid can be found through: The College of Earth and Mineral Sciences: [http://www.ems.psu.edu/prospective_undergrad_students/financial_aid](http://www.ems.psu.edu/prospective_undergrad_students/financial_aid). The Penn State Office of Student Aid: [http://www.psu.edu/studentaid](http://www.psu.edu/studentaid). Please note that students with financial need should complete the U.S. Department of Education Free Application for Federal Student Aid (FAFSA) as soon after January 1st as possible for maximum consideration of available student aid programs. Information is available online at [http://www.fafsa.ed.gov](http://www.fafsa.ed.gov). Any questions concerning scholarship information should be directed to Rachel Altemus, rla7@psu.edu, in 116 Hosler Building.

**PROFESSIONAL DEVELOPMENT**

There are many opportunities and resources for professional development throughout the university. A few are listed below.

**Internships/Job Opportunities**

Many companies recruit our students for internships and full-time employment. Jennifer Howard jxh6@psu.edu 110 Hosler Building handles job recruitment. Job postings, internship opportunities, and other announcements will be posted on a bulletin board outside 104 Hosler Building. You may receive an email notification from Jennifer Howard about job postings; this information will also be placed on ANGEL. Also, please see Jennifer to sign a Transcript Waiver Form for each semester allowing them to print your transcript for company recruitment purposes. Students must provide a current resume to the company position they are applying for.

**Penn State Career Services**

Career planning is often a challenging process that can be complicated by many factors. Students at all phases of career development can benefit from career counseling. Career counselors can help you with four major tasks: clarifying career direction, gaining experience by test-driving your career, searching for a job or applying to graduate school, and developing your résumé and interviewing skills. For more information please see: [http://www.sa.psu.edu/career](http://www.sa.psu.edu/career).

**Leadership and Professional Development Series**

The Leadership and Professional Development Program was created to offer EME students practical hands-on advice and training in professionalism and business etiquette.

**Penn State Engineering Cooperative Education Program**
This is an academic program where you alternate semesters of classroom study with semesters of paid, progressive, career-related experiences in industry through your junior and senior years. For further information, please visit: http://www.engr.psu.edu/coop.

**Fundamentals of Engineering (FE)**
FE exams are offered twice a year. Application deadlines are July 1 for the October exam and December 1 for the April exams. You may obtain applications in the Undergraduate Programs Office Engineering Building Unit #C. The FE examination contains problems that require a variety of approaches and methodologies including design, analysis, application and operations. Some problems may require knowledge of engineering economics. An equation book is distributed at the exam for reference. To prepare for the exam, you can purchase a copy of the equation book from The National Council of Examiners for Engineering and Surveying (NCEES). For further information, please visit http://www.ncees.org.

**The Center for Advanced Undergraduate Study and Experience (CAUSE)**
CAUSE is a formalized research experience for upper-class undergraduate students, which investigates a unique and unrepeatable theme. It is a problem-based collaborative learning course that is taken over two semesters. A small group of students (~15-20) are chosen to participate in the course, which typically involves field work and often involves travel to international locations depending on the course theme. More information including the application details are provided on the EMS website: http://www.ems.psu.edu/prospective_undergrad_students/student_life/cause

**SOCIETIES AND CLUBS**
The John and Willie Leone Family Department of Energy and Mineral Engineering has many programs of study that are related closely to the diverse field of energy and mineral systems and associated student societies. These societies will be discussed later in this manual.

**The Energy Club**
This club is a non-professional undergraduate student group formed to have fun and to explore this multidisciplinary field. All PSU students are invited to participate in our meetings and events (including Fall and Spring picnics, field trips, and guest lectures), including those outside of the John and Willie Leone Family Department of Energy and Mineral Engineering. The Energy Club promotes energy awareness to other Penn State students and the public; including forms of supply & demand, environmental impacts, economics, and the links of energy with industry and society; develops mentoring and guidance to 1st and 2nd year and transfer students; serves as the central student-based outreach element for the John and Willie Leone Family Department of Energy and Mineral Engineering; offers an informal, fun center of activities for all undergraduate students interested in energy topics at Penn State.

**IRVIN HALL**
Irvin Hall houses The Special Living Option (Interest House) for the College of Earth and Mineral Sciences. Irvin Hall is a residence hall, which primarily consists of students from the
college that have a common interest in Earth and Mineral Sciences majors. As active members of the house, students have the opportunity to participate in social, academic and community service activities, as well as intramural sports. Furthermore, house members attend college-sponsored events that enable them to establish close ties with EMS professors. For further information please visit: http://www.irvin.psu.edu.

EMS STUDENT RESOURCES

EMS Ryan Family Student Center
The College provides tutors for English, Chemistry, Math, and Physics. If you are having trouble in any of these courses, you can visit the Student Center in 14 Deike Building. It is recommended that you seek assistance as soon as you start experiencing difficulties to ensure you will not fall behind. http://www.ems.psu.edu/student_center

Fletcher Byrom Earth and Mineral Sciences Library
The Mineral Industries Library was created in 1930 from a collection of approximately 1000 books from Dean Edward Steidle's office. In 2001, the library received an endowment from Mr. George Middlemas and was named the Fletcher L. Byrom Earth and Mineral Sciences Library. Many of the books and materials are relevant to our disciplines and are housed in 105 Deike. For further information please visit: http://www.libraries.psu.edu/emsl.

EMS Museum
The Earth and Mineral Sciences Museum includes collections of rocks, minerals, and fossils. The museum maintains collections of glasses, ceramics, metals, plastics, synthetic materials, old mining and scientific equipment, and archaeological artifacts. Many of these specimens are on display, while the others are available for research and educational purposes. The country's most extensive collection of paintings and sculpture depicting mining and related industries is on display in the museum. The museum serves both as a teaching tool for University courses and as an educational institution, bringing to the general public an appreciation for minerals, mining, and the materials sciences. It is open Monday through Friday, 9:30 a.m. to 5 p.m., is free to everyone, and is located on the ground floor of Deike. For further information please visit: http://www.ems.psu.edu/outreach/museum

STUDENT INVOLVEMENT OPPORTUNITIES

A variety of involvement opportunities are available throughout the university. Some of the department and college opportunities are listed below.

EME Ambassadors
EME Ambassadors are a group of students who represent the John and Willie Leone Family Department of Energy and Mineral Engineering with enthusiasm. They are called upon to participate in events like Career Fairs (on and off campus), tours for potential students, the EME undergraduate event, EMEX, and other varied recruitment efforts. Their work does not take a great deal of time on a regular basis and is a wonderful chance to work more closely with staff, faculty and alumni.
Ambassadors have the opportunity to promote our department's different degree programs to current, future, and past Penn State students. They should enjoy meeting people and working as a team. Special scholarships are reserved for EME Ambassadors. You must have at least three semesters of classes remaining at University Park. GPA is not a factor. For more information please visit, www.eme.psu.edu/ambassadors.

EMS Student Council
The College of Earth and Mineral Sciences Student Council offers opportunities for all EMS students to come together to assist in making the college a better place to work and study. EMS Student Council exists to provide a link between the students, faculty, and alumni of the College. This is done through social events that promote interaction in an atmosphere not regularly experienced on campus. Additionally, the Student Council attempts to offer a variety of outreach programs for new and prospective students. Many of you may have been attracted to the College while attending EMEX, or maybe you have heard about TOTEMS. Both of these events, and several others, were planned and carried out by the Student Council. Maintaining these events helps to make the college experience as enjoyable and fulfilling as possible. For further information please visit, http://www.ems.psu.edu/sc/website.

The Earth and Mineral Sciences Academy for Global Experience (EMSAGE)
EMSAGE was formed in 2009 as a vehicle to foster our students’ global competence and to promote a spirit of integrity, service, and leadership. The intent is that by comprehensively embracing these principles, students will develop into leaders in their chosen discipline, while possessing the breadth and maturity to extend their knowledge to the improvement of society as a whole. More information can be found at: http://www.ems.psu.edu/prospective_undergrad_students/student_life/more_emsage

Earth and Mineral Sciences Exposition (EMEX)
EMEX is the College of Earth and Mineral Sciences Annual Open House. All high school students, current PSU students, and transfer students who are considering an EMS major are invited to attend. Faculty, staff, student, and alumni volunteers provide tours and demonstrations and are available to answer questions about EMS majors, curriculum requirements, career opportunities, student life, and special features of the College of Earth and Mineral Sciences. You will have an opportunity to participate in EMEX through department and college activities.

SCHREYER HONORS COLLEGE
The Schreyer Honors College is a University program for academically superior students. In concurrence with their Honors Advisor, Honors students may tailor their own special academic program for a wide variety of special honors courses, honors sections or regular courses, independent study, and research. The Schreyer Honors Program encourages the fundamental elements of education through interaction between faculty and student; it emphasizes honors classes of reduced size, individual study and research, seminars and discussions. It is designed to broaden the students’ general education, as well as deepen their preparation for graduate study or a profession. The Senior Honors Thesis is a requirement for students participating in the Schreyer Honors Program. Up to six credits of honors course work may be devoted to thesis preparation though 3 credits are more typical for EME students.
Each honors student will be assigned an honors advisor during their freshman year and will have the same advisor for their entire undergraduate studies program. **Honors Advisors:**
Turgay Ertekin- eur@psu.edu, Semih Eser- sxe2@psu.edu, R. Larry Grayson- rlg19@psu.edu, Andrew Kleit- ank1@psu.edu, Mark Klima- msk4@psu.edu, Sarma Pisupati, sxp17@psu.edu

RESERVE OFFICERS TRAINING CORP (ROTC)

Many students choose to join one of the four ROTC programs at Penn State and receive a commission. As a consequence, they will take more than 137 credit courses. University rules allow students to substitute 6 credits of ROTC for credits in the major, provided they successfully complete the ROTC program. ROTC students are normally faced with demanding schedules if they wish to graduate in four years.

3-2 PROGRAM

In cooperation with several academic institutions in the Commonwealth, Penn State offers a 3-2 program in Engineering. The student attends another academic institution for three years then transfers to University Park for his/her last two years. Upon transfer, the student receives up to 76 credits toward a PSU degree. Although all 3-2 programs are not uniform, these credits usually include the freshman-sophomore math, physics, chemistry sequence, some General Education requirements, most communication requirements, and the health and physical activity requirements. During the first semester at Penn State, 3-2 students must submit a 3-2 program course checklist, which will be used to determine degree requirements that have been satisfied. Students should resolve any concerns about transfer credits well before graduation. Most of the time, a syllabus is needed along with a petition, which will be turned into the Undergraduate Staff Assistant. To complete a B.S. degree within our department, the student must successfully complete all our program requirements including prerequisites not completed at the original institution and the minimum of 61 credit-hours at Penn State. In addition, the number of transferred credits, and those taken at PSU, must total at least 137 credits. Upon completion of the program, the student is awarded a degree by the first institution and the B.S. degree by Penn State. Sequencing and scheduling of courses can pose problems if the program is not carefully planned.

SECTION 4: SAFETY

EMERGENCY NUMBERS

<table>
<thead>
<tr>
<th>Fire or accident (Police, Ambulance)</th>
<th>911</th>
</tr>
</thead>
<tbody>
<tr>
<td>Physical Plant (Steam, Electricity)</td>
<td>865-4731</td>
</tr>
<tr>
<td>Environmental Health and Safety Hazardous Material Release</td>
<td>865-6391</td>
</tr>
<tr>
<td>Police Services (Non Emergency)</td>
<td>865-1111</td>
</tr>
<tr>
<td>Lab Supervisor (Tom Motel)</td>
<td>863-1635</td>
</tr>
</tbody>
</table>

SAFETY REGULATIONS

Posted in all our facilities are the University instructions regarding accidents. These instructions include the appropriate telephone numbers and procedures to follow in case of an accident. In addition, it is important to note that all accidents must be reported to the
department office as soon as possible. In the case of any injury, please complete an injury report which can be obtained from Joan Andrews in 117 Hosler. Failure to follow established departmental safety procedures is considered to be a very serious matter and will be dealt with by the Head of the Department directly. Employees are expected to work in a safe manner, using common sense to avoid accidents. Urgency of completing a test or the use of “expedient” procedures or equipment is no excuse for taking chances in the laboratory with unsafe conditions. However, even in situations where conscientious attention to safety is the rule, accidents can occur. **Report accidents as soon as they occur!**

**ENVIROMENTAL SAFETY/CHEMICAL SAFETY COURSE**

Any Teaching Assistant, work study student, or anyone doing research in the laboratories must take and pass a safety exam given by the Environmental Health and Safety Department. A twenty minute Power Point presentation will be presented and then the test will be administered. Contact EHS at [http://www.ehs.psu.edu/training/index.cfm](http://www.ehs.psu.edu/training/index.cfm), for scheduling times.

**SAFETY IN THE LABORTORY**

Be aware of:
1. High voltages
2. Eye hazards such as chemicals, compressed air or steam leaks, chipping and hammering
3. Moving machine parts, such as unguarded coupling or shaft ends, that could catch on clothing
4. Flames near volatile, combustible liquids or gases
5. Compressed gas cylinders

**RULES FOR SAFETY IN LABORTORY**

1. Prevention is the first step to safety.
2. Be aware of all exits, safety devices, and safety response equipment in your area. (This includes fire extinguishers, fire alarm pulls, emergency showers, eye washes, etc).
3. Observe and obey all safety signs and postings.
4. An inspection of all equipment should be done before any machine is turned on. Items to be inspected prior to the operation of a machine will vary with the type of machine.
5. Practice good housekeeping. Do not store items in aisles, walkways, and halls. Dispose of unnecessary and outdated chemicals and store all excess equipment in areas of non-essential access.
6. Do not allow cords and cables to lie across walking paths or hang over counter edges. Do not cover cords with carpets or mats.
7. Safety goggles must be worn when operating any power tool. Also, when hammering or using a punch, chips can fly off these tools. Use laser safety goggles designed for the wavelength and power output of that laser.
8. When operating any power tool, jewelry, such as rings, bracelets, earrings, etc., should be removed.
9. Individuals who have long hair should use a hairnet or other suitable means to prevent hair from being caught while operating any power tools.
10. Always know where the emergency stop is on any machine you are operating.
11. Machine maintenance is important. Do your part to keep machines properly repaired, lubricated and adjusted. Clean up excess lubricants so they don’t get on the floor and cause a slipping hazard. All of the switches and valves that control the machine should be clearly marked.
12. Drill press- Materials being drilled should be secured to the table using a drill vise or other suitable clamping arrangement. Be very careful when drilling materials. Drill bits frequently grab the material when the bit “breaks through”, and instantly spins the work piece, you then have something similar to an electric blender with the blades exposed. This is very dangerous for the hand holding the piece of work. BE CAREFUL!
13. Grinder- Always wear goggles. Never stand directly in front of the wheel, your piece can be grabbed or thrown by the wheel, often quite violently.
14. Never override the safety interlocks intended to prevent operations of any machinery, power tools, or lasers.
15. Be courteous and professional, horseplay does not belong around power tools, someone could fall into the machine, the distraction could cause another to have an accident, etc.
16. Do not attempt to use any laser unless you are familiar with its operations and potential.
17. When optical elements such as lenses, prisms, etc., are used with the laser, be careful to protect personnel in the lab from potential hazards from reflected beams. NEVER look into a laser beam.
18. Cylinders should always be moved using a cylinder cart.
19. Cylinders should be securely chained and stored only in approved areas.
20. Where caps are provided for valve protection, such caps should be kept on cylinders except when cylinders are in use.
21. Make sure the regulator to be used is appropriate for the gas and cylinder pressure. Regulators or pressure gauges provided for use with a particular gas must not be used on cylinders containing different gases. Make sure the threads on the regulator or other unions are the same as those on the cylinder valve outlet. Never force connections that do not fit or tamper with safety devices on valves, cylinders, or regulators.
22. After attaching the regulator and before the cylinder valve is opened, see that the adjusting screw of the regulator is released. Open the cylinder valve slowly; never permit gas to enter the regulator suddenly.
23. Before the regulator is removed from the cylinder, close the cylinder valve and release all gas from the regulator.
24. Never store cylinders near highly flammable substances, such as oil, gasoline, etc.
25. All cylinders should be protected against excessive rise/fall of temperatures.
26. Store full and empty cylinders in separate places.
27. Never attempt to mix gasses in a cylinder.
28. Never permit oil and grease to come in contact with oxygen cylinders, valve regulators, gauges, and fittings. This is an explosive mixture.
29. DO NOT handle oxygen cylinders or apparatus with oily hands or gloves.
30. Never use oxygen from a cylinder without reducing the pressure through a suitable regulator intended for that purpose.
31. After removing the valve cap, open the valve an instant to clear the opening of the particles of dust or dirt.
32. Before the regulator is removed from the cylinder, close the cylinder valve and release all gas from the regulator.
33. Never interchange hoses or other appliances with similar equipment intended for use with other gasses.
34. Where oxygen cylinders are connected to manifolds or headers, such manifolds must be properly designed and equipped with one or more pressure regulators.
35. Never use oxygen as a substitute for compressed air.
36. Acetylene cylinders should never be used at pressures exceeding 15 psi.
37. Never attempt to transfer acetylene from one cylinder to another or to mix any other gas with it in the cylinder.
38. Never try to refill an acetylene cylinder.
39. The pressure in an acetylene cylinder does not accurately indicate the amount of gas contained therein. The amount is determined by weight.
40. Never test for acetylene leaks with an open flame, instead use soapy water.
41. Never use an open flame to detect combustible gas leaks.
42. Store all cylinders containing combustible gasses in a well-ventilated place.
43. Flammable liquids should be stored in and dispensed from approved safety containers and should be kept away from heat and open flames.
44. All chemicals should be stored in suitable cabinets.
45. Chemical storage areas, hoods, and work space should be neat and well organized.
46. Label ALL secondary containers used for storing chemicals, cleaners, specimens, even water. Include on this label (at minimum) the name of the contents, the date the container was filled, and the name of the person filling the container. This removes any question regarding content.
47. The consumption of food or drinks is not permitted in chemical laboratory or storage areas and do not apply cosmetics in areas of potential chemical exposure.
48. If any spills or leaks occur, please inform the personnel in areas below or adjacent to the spill so that appropriate measures to protect personnel and equipment can be made. ALWAYS allow electronic devices ample time to dry before re-energizing.
49. Only qualified personnel are allowed to work on electrical equipment or energized lines. In the event someone appears to be electrocuting themselves, DO NOT TOUCH THEM. Disconnect the power source (only if it can be done safely).
50. Sparks or smoke from a motor or other electrical equipment can mean a shock or fire hazard. Turn off the power at once and report the condition promptly.
51. Electrical equipment should not be operated in wet areas.
52. Electrical equipment possessing frayed or cracked cords should not be used until the cord is replaced.
53. Remove rings and jewelry that may result in electrical contact while working on electrical equipment.
54. Do not overload outlets or receptacles. Do not operate equipment that is intended to have a grounded outlet on a non-grounded power/extension cord.
55. Do not ignore alarms. If one is sounded respond quickly and turn off anything you are using. Leave building immediately and go to the designated area for a head count. This ensures everyone is accounted for and no one is left behind.

Please keep our facilities clean and safe.
SECTION 5: EME LABORATORIES

FACILITIES

EME students have access to excellent experimental and computational laboratories, including state-of-the-art analytical facilities at the Energy Institute and the Materials Research Institute. Our teaching and research facilities are listed below:

**Particle Process Laboratories**

The particle preparation laboratories are primarily used for mineral processing and environmental systems engineering experiments and research. The laboratories are equipped with characterization equipment used for determining physical, surface, and colloid properties of powders and research, and equipment used for crushing and grinding size separations, density-based separations, magnetic and electrical separation flotation separations, and solid-liquid separations.

**Mining Engineering Laboratories**

Surface mining educates students in computer-aided surface mine design, calculation and selection of appropriate surface mining systems. The professional surface mining software includes SURPAC (geological modeling and mine design), TALPAC (loader - trucks simulation), DragSim (dragline simulation), and XPAC (mine planning and scheduling). Students also have access to a rock mechanics laboratory and ventilation laboratory.

**Petroleum and Natural Gas Engineering Laboratories**

The Petroleum and Natural Gas Engineering facilities include production, rock, and fluid properties cement laboratories and a drilling rig simulator. We also have several research laboratories that include multi-phase fluid flow systems, a medical x-ray computerized tomography system, and a high resolution industrial CT scanner.

**Hydrology Laboratory and Fluids Laboratory**

The hydrology laboratory is used for research on permeability testing of rock and soil samples and strength testing of granular materials. The fluids laboratory is used for fluid flow and flame demonstration experiments.

**Fuel Cell and Electrochemical Laboratory**

This laboratory is used primarily for demonstrating fuel cell and hydrogen technology. Using three electrochemical systems, students can study Faraday's laws of electrolysis, learn the Nernst equation in detail, and produce electrical energy.
**Industrial Health and Safety Laboratories**

This laboratory is predominantly used for research and teaching that is related to developing instrumentation for evaluating the effectiveness of respiratory protection, and development of surface acoustic wave (SAW) sensor systems for measuring organic vapors in breath and air. Equipment includes gas chromatographs, a digital fluorometer, respirator fit-testing equipment, a test atmosphere generation system and chamber, and electronic test equipment.

**Computer Laboratory**

We have computer facilities that include a PC-based laboratory available to students on a 24-hour basis. Individuals are expected to exercise responsibility and ethical behavior when using the University’s computer information, networks and resources. Upon admission to the University, all students are notified of the University’s computer policy, Policy AD-20, Computer Network Security. Further information can be found at [http://www.psu.edu/computing/policies](http://www.psu.edu/computing/policies). The EME Department rigorously enforces these policies. Our computer facility is located in 318 Hosler. A student in our department can obtain access to our computer lab by filling out a form which is located outside of the computer lab. Robert Byers is the contact person for computer issues.

**Courtesies for the EME Computer lab:**

Please be responsible. Remember that you are a guest in the lab and act accordingly.

Please be considerate to others working in the lab.

Remember to pick up or throw away anything that you bring into the lab. Cleaning supplies are located in the drawers under the printers.

The lab is NOT a personal storage area for you. Any items left unattended will be removed up and taken the department's lost & found repository in 110 Hosler or disposed.

Do not draw on the tables!

Please remember to push your chair in when you are done.

If you are the last person to leave at night, please turn off the lights and make sure the door is secure.

**Failure to follow these guidelines could lead to a loss of your computer privileges.**
SECTION 6: REQUIREMENTS FOR ALL MAJORS

BASIC MINIMUM REQUIREMENTS FOR ALL MAJORS (GENERAL EDUCATION REQUIREMENTS)

The following general requirements have been established for all students in the college who are candidates for the degree of Bachelor of Science. The specific requirements of individual majors are in addition to the following:

1. COMMUNICATIONS (GWS): 9 credits EM SC 100S, ENGL 15, 202C
2. QUANTIFICATION (GQ): 6 credits
3. NATURAL SCIENCES (GN): 9 credits
4. ARTS (GA): 6 credits
5. HUMANITIES (GH): 6 credits
6. SOCIAL AND BEHAVIORAL SCIENCES (GS): 6 credits
7. HEALTH SCIENCES AND PHYSICAL EDUCATION (GHA): 3 credits

United States Cultures and International Cultures:
(Included in General Education course selection)

Writing Across the Curriculum:
(Included in Requirements for the Major)

Some of these requirements may satisfy both General Education requirements and Major requirements. Substitutions may be made; however, your advisor and Program Officer must approve them.

FIRST-YEAR SEMINAR

Incoming students are required to take a first-year seminar during their first year at Penn State. Offerings will vary from semester to semester. Students transferring from other colleges or universities are exempt from taking this course; however, they are required to take a speech communication course.
SECTION 7: DESCRIPTION AND REQUIREMENTS FOR MAJORS

ENERGY BUSINESS AND FINANCE (EBF) - 120 Credits
Program Officer: Andrew Kleit, ank1@psu.edu.

Program Overview
Students interested in discovering contemporary business strategies and solutions for Earth's energy and environmental outlook will find this program a good fit. The curriculum also provides a strong base for further study in business, economics, law and social sciences.

Program Objectives
This major, offered jointly by the College of Earth and Mineral Sciences and the Smeal College of Business, combines training in business, economics, finance, and the physical sciences with a core of classes focusing on the energy and related industries.

Options
Students in the EBF program can pursue the General, Geographic Information Sciences (GIS) or the Energy Systems option. All three options require 18 credits of specialized courses. The General option provides more flexibility to the student in course selection. The GIS option is designed to develop competence in description, analysis, explanation, and management of problems arising from human use of natural resources and natural systems. Using GIS brings further depth to the analysis of the impacts of a variety of policy measures. The Energy Systems option is designed to give graduates a background in energy engineering, to facilitate and improve their careers. This option first gives students a basic understanding of energy engineering principles.

Careers
The major helps prepare students for careers in the energy industry, climatological and meteorological business and communications firms, as well as financial institutions, non-profit groups, and international organizations dealing with energy issues. Due to electricity deregulation there has been a dramatic increase in the demand by utility companies for employees who understand the basic sciences of energy while also understanding the basic
roles of financial markets. In addition, there has been a dramatic increase in the number of energy commodities futures and options traded on major exchanges. One of the most interesting of those commodities contracts deals with weather derivatives, a market of great interest to many in EMS programs.

**Energy Business and Finance Society** offers students within the EBF major, or those with interest in the major, a different array of venues to learn about the opportunities that come with the program. Students work on several areas including company relations, alumni involvement, resume and interview preparation, recruiter receptions and promoting the major to increase awareness within our college and the university. **Faculty Advisor**- Seth Blumsack, sab51@psu.edu. For further details visit: [http://www.eme.psu.edu/ProfessionalSocieties/ebfsociety.html](http://www.eme.psu.edu/ProfessionalSocieties/ebfsociety.html).
Recommended Academic Plan for B.S. in Energy, Business, and Finance - Energy Systems Option University Park Campus Effective Summer / Fall 2010

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- **Supporting classes (17 credits)** MATH140(4), MATH 141(4), CHEM12(3), ECON 004(GS)(3) (Sem 1-2), PNG 489(3) (Sem 5), Classes in Engineering Principles
- **Either:** EGEE 301(6) (Sem 3-4) OR ME 030(3), AND EGEE 302(3) (Sem 3-4)
- Then 3 credits from EGEE 304, EGEE 430 OR ME 430, ME 416, EGEE 420, ME 408 (Sem 5-6)
- Classes in Engineering Applications (9 credits)

EGEE 437, EITHER EGEE 470, OR ME 470, F SC 431, F SC 432, EGEE 438, EGEE 451, OR ME 470
### Recommended Academic Plan for B.S. in Energy, Business, and Finance - General Option Effective University Park Campus Effective Summer / Fall 2010

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- **PRESCRIBED COURSES** (9 credits)
  - GEOG 126 GS;US;IL(3)[1]
  - GEOG 160 GS(3)[1], GEOG 363(3) (Sem: 3-4)
- **ADDITIONAL COURSES** (12 credits)
  - Select 3 credits from GEOG 361(3), GEOG 362(3), GEOG 464(3) (Sem: 5-6)
  - Select 9 credits from GEOG 485(3), GEOG 461W(3), GEOG 467(3), GEOG 463(3), GEOG 468(3), GEOG 464(3) [if not taken for requirement above], GEOG 465 (3) (Sem: 6-8)
Program Overview
The undergraduate program in Energy Engineering is designed to address the growing energy impact and demand, and to equip students with the necessary knowledge and skills to address society’s energy needs. The program prepares students to be successful leaders in advancing the technology and management of energy; innovators and entrepreneurs in the energy sector; and educators, practicing engineers, and national leaders in the energy and associated environmental health and safety, policy and economic fields. It trains students to be lifelong learners, problem solvers, and energy industry leaders. The curriculum is sufficiently flexible, broad, and diverse to enable students to tailor their educational experience to particular interests, backgrounds, and expected roles in society. This flexibility allows students in energy-related programs, such as agricultural and biological, chemical, electrical, environmental, mechanical, nuclear, and petroleum engineering, materials science and engineering, industrial health and safety, and business and finance, to have dual or concurrent degrees, minors, or options. Students will also have opportunities to conduct independent research and participate in capstone design team projects with students from other engineering disciplines.

Program Objectives
As a graduate of Penn State's Energy Engineering program, the integration of knowledge and skills you acquire will enable you to: (1) acquire data and define, analyze, and solve energy and associated environmental problems using the fundamental knowledge learned; (2) integrate professional, ethical, social and environmental factors in energy engineering design and problem solving; (3) develop the ability to effectively communicate and interact in teamwork; (4) acquire the desire for lifelong learning to maintain technical competence and keep abreast of new developments in the field.

Careers
With the world’s thirst for energy continuing to grow, there is now an urgent demand for a well trained workforce to develop processes, utilize and manage conventional, unconventional, and renewable energy sources in an environmentally safe and economically feasible way. Therefore, graduates of the Energy Engineering program will have many diverse options that include the opportunity to become valuable contributors in addressing society's energy needs and demands, successful leaders in advancing the technology and management of energy, and innovators and entrepreneurs in the energy sector. They can also enter private or public sectors as Energy Engineers to evaluate and recommend energy generation, production and processing methods and strategies. The student can contribute in designing/developing novel catalytic/biological/chemical processes and/or maintaining upstream technologies for petroleum and natural gas processing industries or unconventional fuels such as coal to liquids or oil shale/tar sands processing industries. They can join automobile manufacturing industries to work in traditional internal combustion engines or develop novel fuel cell based vehicles. And finally, they can join major power companies in designing/maintaining/developing environmentally sound renewable power systems such as wind, solar, hydro, and geothermal or coal, oil, or gas-based power generation systems.
Recommended Academic Plan for B.S. in Energy Engineering University Park Campus Effective Summer / Fall 2010

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- **GWS, GHA, GQ, GN, GA, GH, and GS** are codes used to identify General Education requirements.
- **US, IL,** are codes used to designate courses that satisfy University United States/International Culture requirements.
- **W** is the code used to designate courses that satisfy University Writing Across the Curriculum requirement.

**Program Notes:**

- Students may satisfy their 18 required GA, GH and GS requirements either with 6/6/6 or 3/6/9 (any combination); a degree audit petition must be submitted to the associate dean for education in 14 Deike Building.
- Students who begin their studies at non-UP locations and/or join the college after their freshman semester may substitute CAS 100 GWS or ENGL 202C GWS for EM SC 100S GWS.
- Technical Elective (students may also apply up to 6 credits of ROTC)
ENVIRONMENTAL SYSTEMS ENGINEERING (ENVSE) – 131 CREDITS

PROGRAM OFFICER: M. Thaddeus Ityokumbul, mti1@psu.edu

Program Overview
The Environmental Systems Engineering program is accredited by the Engineering Accreditation Commission of the Accreditation Board for Engineering and Technology (ABET). It is an interdisciplinary program concerned with the impact of industrial activities on the environment and the choice of cost-effective remediation strategies. The program is unique as it is designed to address critical environmental problems of the basic industries such as those involved in the extraction, conversion, and utilization of energy and mineral resources. The program culminates with the capstone design course, which is an integrated, problem-based, to design an environmental remediation system. Students have the choice of pursuing the option in Environmental Systems Engineering or Environmental Health and Safety Engineering.

Program Objectives
The integration of knowledge and skills acquired during the course of study enables graduates of Penn State's Environmental Systems Engineering program to: (1) enter the private or public sectors as environmental systems engineers to solve a broad range of environmental problems associated with the resource recovery and process industries or pursue an advanced degree; (2) addresses critical environmental problems of the basic industries, especially those involved with the extraction, conversion, and utilization of energy and mineral resources; design effective and economic engineering systems to alleviate such problems, individually and in a team setting; and communicate the results effectively; (3) evaluate the impact of environmental pollution control on the viability of industrial operations, including health and safety, social, and ethical aspects; and an awareness of environmental regulations; evaluate novel strategies for minimizing pollution control costs in the process industries; (4) recognize the need to maintain professional competency and the value of life-long learning.

Careers
ENVSE students are employed by large corporations to identify, monitor and reduce emissions and discharges to ensure compliance with environmental regulations; to obtain legal permits for company activities; trouble-shoot problems; design waste handling procedures; and supervise recycling and multiple-use activities. They are employed by consulting companies in planning and design associated with environmental conservation and restoration. They are employed by government agencies at federal, state, regional and urban levels to provide expertise in the development, implementation and enforcement of environmental legislation.

Society of Environmental Systems Engineers (SESE) provides a forum for the concerns and interests of ENVSE students. Goals include publicizing ENVSE to industry, corporations, and the general public. Activities include creating awareness of ENVSE at Penn State, encouraging student involvement, outreaching with industry and government professionals, and participating in EMEX.

Faculty Advisor: Mark Klima, msk4@psu.edu. For further details visit: http://www.eme.psu.edu/ProfessionalSocieties/SEEsoc.html.
### Recommended Academic Plan for B.S. Option in Environmental Systems Engineering University Park Campus Effective Summer / Fall 2010

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**Program Notes:**

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- Technical Elective (students may also apply up to 6 credits of ROTC)
- ** Approved course on Georesource Evaluation
In response to the needs and requests of the many companies that hire our graduates, the former Industrial Health and Safety program became an option within the Environmental Systems Engineering degree program, accredited by the Engineering Accreditation Commission of ABET.

**Program Overview**

This option is designed to provide students with the technical skills necessary to address the occupational health and safety concerns associated with the mining, manufacturing, construction, and government sectors. Employers in the United States are mandated by federal and state laws to provide workplaces that are free of recognized hazards to personnel. Agencies, such as OSHA and MSHA, have placed increased emphasis on employer responsibilities for the health and safety of their employees. Annually, work-related accidents affect not only workers' compensation but also reduce productivity.

**Careers**

Environmental health and safety professionals are the people who make safety happen. They have a bright future in industry as inspectors, investigators, analysts, trainers, and program administrators. They are found in government agencies and in the construction, energy, minerals, chemical, transportation, and heavy manufacturing industries. Employment opportunities also exist in research organizations and private consulting companies, compliance officer, health and safety specialist, industrial hygienist, safety engineer, loss control specialist, health and safety manager, and corporate safety director.

**Industrial Health and Safety Society** provides enriching educational experiences for students that will prepare them for their professional future. Lectures from professionals in the field such as the National Safety Council, American Society of Safety Engineers, American Industrial Hygienist Association, National Fire Protection Agency, volunteer community actions, and field trips to conferences and facilities, contacts and networking activities may lead to future job opportunities. **Faculty Advisor:** William Groves, wag10@psu.edu. For further details visit: [http://www.eme.psu.edu/ProfessionalSocieties/IHSsoc.html](http://www.eme.psu.edu/ProfessionalSocieties/IHSsoc.html).
### Recommended Academic Plan for B.S. Option in Environmental Health and Safety Engineering University Park Campus Effective Summer / Fall 2010

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- Students who begin their studies at non-UP locations and/or join the college after their freshman semester may substitute CAS 100 GWS or ENGL 202C GWS for EM SC 100S GWS.
- Technical Elective (students may also apply up to 6 credits of ROTC).
- **Approved course on Georesource Evaluation**
MINING ENGINEERING (MNG E) - 130 Credits

Program Officer: R. Larry Grayson, rlg19@psu.edu.

Program Overview
The Mining Engineering Program is accredited by the Engineering Accreditation Commission of the Accreditation Board for Engineering and Technology (ABET). Mining engineers recover the minerals and energy resources essential to the functioning of human society. Mining engineers search for new mineral deposits and determine if they can be mined economically, they design and construct mines on and below the surface, manage and operate mines, and prepare the raw mineral products necessary for the manufacturing and energy industries.

Program Objectives
The aim of Penn State’s Mining Engineering program is to: (1) deliver curriculum material that is of sufficient science and engineering rigor to ensure that students have the basis for entering the private or public sectors as mining engineers, or higher education, if they so choose; (2) enable students to comprehend the interrelationships among geology, exploration, valuation, development, exploitation, and processing of mineral deposits in a coordinated manner, from the introductory mining course to the capstone mine-design course; (3) encourage student use of computer and information technology, in a comprehensive manner, as it relates to engineering applications for mineral resources; (4) stimulate student awareness, appreciation, and communication capabilities to address societal concerns with regard to the total environment, health and safety, sustainable development, and the conservation of our natural resources; (5) promote the concepts of teamwork, lifelong learning, and effective and ethical leadership.

Careers
Many rewarding positions are available in mining today. Mining engineers are employed in every U.S. state and throughout the world. Mining means more than coal, copper, and gold -- it also means bauxite and salt, rare minerals and common gravel, limestone and building stone. Wherever productive mineral deposits are found -- in remote outposts or close to metropolitan areas -- mining engineers can find a use for their special skills. Not all mining engineers work in mines, or even for mining companies. Some choose to work for manufacturers of mining equipment in design, applications, or marketing. Some work as planning specialists at corporate headquarters. Others work for state or federal agencies involved with inspection and enforcement of mining regulations. Mining engineers also find careers with large financial, planning, and engineering firms. There are many opportunities for those who like practical, hands-on work, and for those who prefer office or laboratory positions.

Penn State Mining Society aids and encourages the professional development of its individual members of the society, promoting self-sought, increasing knowledge of Mining Engineering and Mineral Processing, to instill a professional pride in their careers, to provide a forum for meeting and discussing matters of interest with the mining industry, and to facilitate between the Society for Mining, Metallurgy, and Exploration, Inc. (the professional society for mining engineers). Faculty Advisor: R. Larry Grayson, rlg19@psu.edu. For further details visit: http://www.eme.psu.edu/ProfessionalSocieties/mngsoc.html.

The International Society of Explosives Engineers (ISEE) a professional society dedicated to promoting the safety, security and the controlled use of explosives in mining, quarrying, construction, manufacturing, demolition, aerospace, forestry, avalanche control, art, automotives, special effects, exploration, seismology, agriculture, law enforcement, and many other peaceful uses of explosives. Faculty Advisor: Dr. Jamal Rostami, jur17@psu.edu.
Recommended Academic Plan for B.S. in Mining Engineering University Park Campus Effective Summer / Fall 2010

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- **Bold type** Required minimum grade of C (2.0).
- *Italic type* indicates courses that satisfy both major and General Education requirements.
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- US, IL, are codes used to designate courses that satisfy University United States/International Culture requirements
- W is the code used to designate courses that satisfy University Writing Across the Curriculum requirement

**Program Notes:**

- *Students may satisfy their 18 required GA, GH and GS requirements either with 6/6/6 or 3/6/9 (any combination); a degree audit petition must be submitted to the associate dean for education in 14 Deike Building.
- Students who begin their studies at non-UP locations and/or join the college after their freshman semester may substitute CAS 100 GWS or ENGL 202C GWS for EM SC 100S GWS.
- Technical Elective (students may also apply up to 6 credits of ROTC)
Program Overview
The Petroleum and Natural Gas Engineering program is accredited by the Engineering Accreditation Commission of the Accreditation Board for Engineering and Technology (ABET). The undergraduate curriculum in Petroleum and Natural Gas Engineering has been designed to equip the student with the fundamentals necessary to achieve lifelong professional growth. Graduates are prepared to enter both the private and public sectors as petroleum and natural gas engineers or to pursue further education at the graduate level. The courses are structured to serve as a melting pot for theory, application to case studies and engineering project design. The thrust of the program structure emphasizes the fundamentals of mathematics and earth and engineering sciences and integrates them in application to traditional petroleum and natural gas engineering topics. Graduates of the program are expected to perform in various facets of the petroleum industry including drilling, production, evaluation, transportation and storage.

Program Objectives
Integration of knowledge and skills acquired during the course of study enables the graduates to: (1) solve petroleum and natural gas engineering process problems using knowledge of applied mathematics, science, and economics; (2) acquire technical data, analyze them, and use them to design petroleum and natural gas engineering systems; (3) integrate professional, ethical, social, and environmental considerations into petroleum and natural gas engineering design and problem solving; (4) develop ability to communicate engineering results effectively and provide experience in team efforts; (5) acquire the habit of continuous learning to maintain technical competence and to keep abreast of contemporary issues.

Careers
Petroleum and natural gas engineers have the opportunity to work in a variety of locations around the world. They work as drilling engineers who design and supervise the drilling of oil and gas wells; production engineers who design facilities that produce oil and gas; reservoir engineers who evaluate and forecast oil and gas field performance, design extraction processes, and conduct economic evaluations; marketing engineers who handle sales marketing and transportation of oil and gas products; research scientists and engineers who find new ways of improving production, reservoir recovery processes, performance, and treatment processes; educators who train the next generation of petroleum engineers.

Society of Petroleum Engineers (SPE) Penn State Student Chapter is affiliated with the Petroleum and Natural Gas Engineering degree program in the John and Willie Leone Family Department of Energy and Mineral Engineering. Currently, the society has approximately fifty undergraduate and graduate members enrolled in the chapter. Goals for this society include: mentoring of freshmen and sophomores, leadership skills training, resume assistance, extracurricular involvement, and qualified students who have been exposed to the society through our mentoring program to hold positions in office. Faculty Advisor: Zuleima Karpyn,
ztk101@psu.edu. For further details visit:
http://www.eme.psu.edu/ProfessionalSocieties/spesoc.html.
# Recommended Academic Plan for B.S. in Petroleum and Natural Gas Engineering University Park Campus

**Effective Summer / Fall 2010**

<table>
<thead>
<tr>
<th>SEMESTER 1</th>
<th>CREDITS</th>
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**Program Notes:**

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- Technical Elective (students may also apply up to 6 credits of ROTC)
SECTION 8: MINORS AND OPTIONS AVAILABLE IN EME

ENERGY ENGINEERING MINOR (18 CREDITS)
The minor in Energy Engineering is designed to provide students in engineering, science, and energy business and finance (EBF) with additional courses, exposure, and experiences to the principles and applications of energy engineering. Courses available to students include thermal sciences; petroleum and natural gas processing; renewable/sustainable energy; chemistry of fuels; electrochemical, chemical and nuclear energy conversion processes; physical processes in energy engineering; air pollution; and green engineering and environmental compliance. As a result, the selection of this minor can provide additional career options for students in a wide range of offerings at Penn State. A grade of C or better is required for all courses in the minor.

Faculty Contact: Sarma Pisupati, spx17@psu.edu

Select 9 credits from the following courses: 5 and 6 semesters

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<td>EGEE 420</td>
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Select 9 credits from the following courses: 7 and 8 semesters

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<td>F SC 432</td>
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GLOBAL BUSINESS STRATEGIES FOR THE EARTH, ENERGY, AND MATERIAL INDUSTRIES MINOR (18 CREDITS)
The minor in Global Business Strategies for the Earth, Energy, and Materials Industries is a joint offering of the College of Earth and Mineral Sciences and the Smeal College of Business. The minor introduces students to financial, investment, and management concepts applied to private sector organizations whose operation emphasizes the Earth and its environment, the energy and mineral industries, or the development of new and enhanced materials. The minor focuses on the leadership and information strategies characteristic of enterprises that are succeeding in a rapidly integrating global economy.

Faculty Contact: Andrew Kleit, ank1@psu.edu

Prescribed Courses 6 Credits

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<tr>
<th>Course</th>
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<tr>
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<td>EM SC 401</td>
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Additional Courses 6 credits Select 6 credits from category A or B

A  BA 301 2   BA 302 2
B  FIN 100 or EM SC 301 3   MGMT 100 or EM SC 304 3
         BA 304 2

Supporting Courses and Related Areas Select 6 credits from the approved list of EMS courses.

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<td>ENNEC 473</td>
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<td>GEOG 430</td>
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<td>GEOG 431</td>
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</table>
INDUSTRIAL HEALTH AND SAFETY MINOR (18 CREDITS)
The minor in I H S offers a specialized program for students in many other broad-based majors, such as in engineering or sciences, who wish to pursue a career in the areas of occupational safety and health or public health. It offers an array of courses, which provide insight into these and other similar professions. A grade of C or better is required for all courses in the minor.
Faculty Contact: William Groves, wag10@psu.edu

Prescribed Courses 9 credits
I H S 400 3
I H S 430 3

Additional Courses 9 Credits
I H S 410 3
I H S 420 3
I H S 440 3

MINING ENGINEERING MINOR (18 CREDITS)
The minor in Mining Engineering offers a specialized program for students in many other broad-based, technical majors, such as those in engineering or science. The demand for professionals with the training and skills for a career in the minerals- and energy-recovery profession far exceeds the supply. Mineral exploration and evaluation, mine development, marketing, health and safety, environmental protection, and mine management are all areas of industry employment. A grade of C or better is required for all courses in the minor.
Faculty contact: R. Larry Grayson, rlg19@psu.edu

Prescribed Courses
MNG 30 3
MNG 404 3
MNG 410 3
MNG 412 3
MNG 422 3
MNG 441 3

OPTION IN ENERGY AND FUELS ENGINEERING (EFE) IN THE CHEMICAL ENGINEERING MAJOR (18 CREDITS)
The aim of this degree option in Energy and Fuels Engineering is to provide students with the technical skills needed to address national and global issues facing society arising from the complexities of assuring an abundant and efficient energy supply while responsibly preserving the quality of the environment. The Option is designed to build on the solid core of Chemical Engineering training with specialized courses in fuel and energy science and technology. Faculty Contact: Semih Eser, sxe2@psu.edu

Prescribed Courses
EGEE 411 (FSC 410) Fuel Science Laboratory 3

Supporting Courses (Choose 3 credits from list)
EGEE 430 (FSC 416) Introduction to Combustion 3
I H S 400 Principles of Industrial Health and Safety 3
Electives (Choose 12 credits from list)

<table>
<thead>
<tr>
<th>Course</th>
<th>Title</th>
<th>Credits</th>
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<td>EGEE 430 (FSC 416)</td>
<td>Introduction to Combustion</td>
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<td>F SC 431</td>
<td>The Chemistry of Fuels</td>
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<tr>
<td>F SC 432 replace CHE 4x</td>
<td>Petroleum Processing</td>
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<td>F SC/ CH E 435</td>
<td>Industrial Organic Chemistry</td>
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<tr>
<td>EGEE 420</td>
<td>Fuel Cells</td>
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<td>PNG 410</td>
<td>Applied Reservoir Engineering</td>
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<td>PNG 480</td>
<td>Production Process Engineering</td>
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<tr>
<td>I H S 420</td>
<td>Fire Protection</td>
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<td>I H S 445</td>
<td>Industrial Hygiene and Toxicology</td>
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<td>Industrial Hygiene Measurements</td>
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<td>I H S 450</td>
<td>Environmental Health and Safety</td>
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<tr>
<td>I H S 470</td>
<td>Analytical Methods for Systems Safety</td>
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<tr>
<td>GEOEE 427</td>
<td>Pollution Control in the Process Industries</td>
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</table>

These electives, if chosen properly, will allow students to pursue one of three possible focus areas within the option: Conversion Technologies; Petroleum and Natural Gas Engineering; or Industrial Health and Safety. The recommended schedules for each of these areas are shown below.

Focus area 1: Conversion Technologies

<table>
<thead>
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<th>Fall Semester</th>
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<tbody>
<tr>
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<td>F SC 420</td>
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<tr>
<td>Senior</td>
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Focus area 2: Petroleum and Natural Gas Engineering

<table>
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<th>Spring Semester</th>
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<tbody>
<tr>
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<td>Senior</td>
<td>F SC 432</td>
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Focus area 3: Industrial Health and Safety

<table>
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<th>Fall Semester</th>
<th>Spring Semester</th>
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<tbody>
<tr>
<td>Junior</td>
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<tr>
<td>Senior</td>
<td>I H S 445 OR I H S 470</td>
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SECTION 9: EXAMPLES OF DEGREE AUDITS

EXPLANATION OF DEGREE AUDITS

An explanation the major’s Degree Audit is provided below. The degree audit will help you stay on your educational career path. Check your audit form and if you notice any discrepancies with your records, see your advisor to correct the problem.

A. Indicates the date/time when the audit was prepared, your nine digit PSU ID, your name, program year, and degree information.

B. Indicates your current program information.

C. Indicates whether all requirements have been met. When all the requirements are completed in a certain section, the minuses will turn to plusses.

D. Indicates your grades from the previous semester.

E. Indicates your current schedule.

F. Indicates GPA for the major on some audits.

G. Indicates the Major Requirements. When a course is taken it will list the semester you took it, course number, credits, your grade and any relevant code (see legend).

H. Option Requirement for certain degrees.

I. Indicates General Education Requirements. It mirrors the Major Requirement section.

J. Indicates Other Courses. If you take courses that do not fit into Major/General Education requirements, they will be listed here.

K. Indicates high school foreign/second language admission requirements. It will either have an ok or no to the left.

L. First Year Seminar.

M. Writing Across the Curriculum.

N. United States Culture and International Cultures (US/IL)

O. Indicates general graduation requirements- Senate Policy 83-80.

P. Indicates minimum GPA- Senate Policy 82-40.

Q. Indicates total credits needed and earned.

R. Indicates the legend.
ENERGY BUSINESS AND FINANCE ENERGY SYSTEMS OPTION DEGREE AUDIT

PREPARED: 05/11/10 - 10:25
EM EBF

MAJOR/OPTION REQUIREMENTS

AUDIT CODE: B S EBF ESYST
PROGRAM YEAR: 2010

PENN STATE DEGREE AUDIT REPORT
BACHELOR OF SCIENCE
ENERGY, BUSINESS AND FINANCE-ENERGY SYSTEMS OPTION

-----------------------------------------------------------------
AT LEAST ONE REQUIREMENT HAS NOT BEEN SATISIFIED
-----------------------------------------------------------------

GRADES FOR FALL SEMESTER 2009

CURRENT SCHEDULE

NO MAJOR REQUIREMENTS

--> NEEDS: 7 SUBREQMNTS

- 1) TAKE ALL OF THE FOLLOWING
   **C OR HIGHER GRADE REQUIRED**
   **CREDITS MAY ALSO APPLY TO GENERAL EDUCATION**
   COURSE LIST: ECON 002, 302, E B F200, MATH 140, 141

- 2) TAKE THE FOLLOWING
   **CREDITS MAY ALSO APPLY TO GENERAL EDUCATION**
   NEEDS: 3.0 CREDITS
   COURSE LIST: EM SC100S

- 3) TAKE 6 CREDITS IN COMPOSITION/WRITING
   **CREDITS MAY ALSO APPLY TO GENERAL EDUCATION**
   NEEDS: 6.0 CREDITS
   COURSE LIST: ENGL 015 OR 030, 202C OR 202D

- 4) TAKE 3 CREDITS IN COMPUTER SCIENCE
   **0-3 CREDITS MAY ALSO APPLY TO GENERAL EDUCATION**
   NEEDS: 3.0 CREDITS
   COURSE LIST: CMPSC101, 200, 201, 202, EM SC468

- 5) TAKE ALL OF THE FOLLOWING
   **C OR HIGHER REQ'D IN EBF 401 & ENNEC 484**
   COURSE LIST: ACCTG211, E B F301, 304W, 401, 473
   ENNEC484, I B 303, INS 301

- 6) TAKE 3-4 CREDITS IN LEGAL BUSINESS ENVIRONMENT
   NEEDS: 3.0 CREDITS
   COURSE LIST: B A 243, B LAW243, E R M411

- 7) TAKE 3 CREDITS IN STATISTICS
   **C OR HIGHER GRADE REQUIRED**
   NEEDS: 3.0 CREDITS
   COURSE LIST: E B F472, STAT 301, 401

-----------------------------------------------------------------
NO OPTION REQUIREMENTS

--> NEEDS: 5 SUBREQMNTS

- 1) TAKE ALL OF THE FOLLOWING
   **CREDITS MAY ALSO APPLY TO GENERAL EDUCATION**
   COURSE LIST: CHEM 110, 111, 112, PHYS 211, 212

- 2) TAKE THE FOLLOWING
   COURSE LIST: P N G489

- 3) TAKE 6 CREDITS IN ENGINEERING PRINCIPLES
   **C OR HIGHER GRADE REQUIRED**
   NEEDS: 6.0 CREDITS
   COURSE LIST: EME 301, 303

- 4) TAKE 3 ADDITIONAL CREDITS IN ENGINEERING PRINCIPLES
   **C OR HIGHER GRADE REQUIRED**
   NEEDS: 3.0 CREDITS
   COURSE LIST: EGEE 302, 304, 430, M E 430

- 5) TAKE 9 CREDITS IN ENGINEERING APPLICATIONS
   NEEDS: 9.0 CREDITS
   COURSE LIST: EGEE 420, 430 OR M E 430, EGEE 437, EGEE 438, 441, 451, 470 OR M E 470, F SC 431, F SC 432

-----------------------------------------------------------------
NO GENERAL EDUCATION REQUIREMENTS

--> NEEDS: 10 SUBREQMNTS
- 1) TAKE ENGL 015 OR 030 (3 CREDITS)
- 2) TAKE ENGL 202 (3 CREDITS)
- 3) TAKE CAS 100 (3 CREDITS)
- 4) TAKE 3 CREDITS IN QUANTIFICATION (GQ) - SELECT FROM MATHEMATICS, APPLIED MATHEMATICS OR STATISTICS
- 5) TAKE 3 CREDITS IN QUANTIFICATION (GQ) - SELECT FROM ANY QUANTIFICATION AREA
- 6) TAKE 9 CREDITS IN NATURAL SCIENCES (GN)
- 7) TAKE 6 CREDITS IN ARTS (GA)
- 8) TAKE 6 CREDITS IN HUMANITIES (GH)
- 9) TAKE 6 CREDITS IN SOCIAL & BEHAVIORAL SCIENCES (GS)
- 10) TAKE 3 CREDITS IN HEALTH AND PHYSICAL ACTIVITY (GHA)

-----------------------------------------------------------------
OTHER COURSES
-----------------------------------------------------------------
FOREIGN/SECOND LANGUAGE ADMISSION REQUIREMENT
-----------------------------------------------------------------
NO FIRST-YEAR SEMINAR
TAKE 1 CREDIT MINIMUM IN FIRST-YEAR SEMINAR
-----------------------------------------------------------------
NO WRITING ACROSS THE CURRICULUM
TAKE 3 CREDITS IN 'W' SUFFIX COURSES FROM YOUR COLLEGE
-----------------------------------------------------------------
NO UNITED STATES CULTURES AND INTERNATIONAL CULTURES (US/IL)
--> NEEDS: 2 SUBREQMNTS
- 1) TAKE 3 CREDITS IN UNITED STATES CULTURES (US)
- 2) TAKE 3 CREDITS IN INTERNATIONAL CULTURES (IL)
-----------------------------------------------------------------
NO GENERAL GRADUATION REQUIREMENTS - SENATE POLICY 83-80
- 1) AT LEAST 36 OF THE LAST 60 CREDITS MUST BE EARNED AT PENN STATE
   NEEDS: 36.0 CREDITS
- 2) AT LEAST 60 CREDITS MUST BE EARNED IN LAST FIVE YEARS
   NEEDS: 60.0 CREDITS
-----------------------------------------------------------------
NO MINIMUM 2.00 CUMULATIVE GRADE POINT AVERAGE REQUIRED FOR GRADUATION - SENATE POLICY 82-40
-----------------------------------------------------------------
NO MINIMUM 120.0 CREDITS REQUIRED FOR GRADUATION
--> NEEDS: 120.0 CREDITS

LEGEND
NO Requirement not completed
OK Requirement completed
IP Requirement in-progress, OK when satisfactorily completed
OR One requirement/subrequirement of group needs to be completed
- Subrequirement not completed
+ Subrequirement completed or in-progress
* Subrequirement not required, but courses apply
RG Registered course
SH Scheduled course
TR Transfer course
IL Independent Learning course, in-progress
PA Portfolio assessment course
LD Late dropped course
> Repeatable course, counts more than once
>= Duplicate course, counts once
> Credits split between two or more requirements
>Y Credit limit for repeat course exceeded

********************* END OF ANALYSIS *********************
ENROLLMENT BUSINESS AND FINANCE GENERAL OPTION DEGREE AUDIT
PREPARED: 05/11/10 - 10:19  EM EBF
MAJOR/OPTION REQUIREMENTS
AUDIT CODE: B S EBF  PROGRAM YEAR: 2010

PENN STATE DEGREE AUDIT REPORT
BACHELOR OF SCIENCE
ENERGY, BUSINESS AND FINANCE-GENERAL OPTION
-----------------------------------------------------------------
AT LEAST ONE REQUIREMENT HAS NOT BEEN SATISFIED
-----------------------------------------------------------------
** GRADE POINT AVERAGE FOR THE MAJOR **
-----------------------------------------------------------------
NO MAJOR REQUIREMENTS
--> NEEDS: 7 SUBREQMNTS

- 1) TAKE ALL OF THE FOLLOWING
**C OR HIGHER GRADE REQUIRED**
**CREDITS MAY ALSO APPLY TO GENERAL EDUCATION**
COURSE LIST: ECON 002,302 E B F200 MATH 140,141
- 2) TAKE THE FOLLOWING
**CREDITS MAY ALSO APPLY TO GENERAL EDUCATION**
NEEDS: 3.0 CREDITS
COURSE LIST: EM SC100S
- 3) TAKE 6 CREDITS IN COMPOSITION/WRITING
**CREDITS MAY ALSO APPLY TO GENERAL EDUCATION**
NEEDS: 6.0 CREDITS
COURSE LIST: ENGL 015 OR 030,202C OR 202D
- 4) TAKE 3 CREDITS IN COMPUTER SCIENCE
**0-3 CREDITS MAY ALSO APPLY TO GENERAL EDUCATION**
NEEDS: 3.0 CREDITS
COURSE LIST: CMPSC101,200,201,202 EM SC468
- 5) TAKE ALL OF THE FOLLOWING
**C OR HIGHER REQ'D IN EBF 401 & ENNEC 484**
COURSE LIST: ACCTG211 E B F301,304W,401,473
ENNEC484 I B 303 INS 301
- 6) TAKE 3-4 CREDITS IN LEGAL BUSINESS ENVIRONMENT
NEEDS: 3.0 CREDITS
COURSE LIST: B A 243 B LAW243 E R M411
- 7) TAKE 3 CREDITS IN STATISTICS
**0-3 CREDITS MAY ALSO APPLY TO GENERAL EDUCATION**
NEEDS: 3.0 CREDITS
COURSE LIST: E B F472 STAT 301,401
-----------------------------------------------------------------
NO OPTION REQUIREMENTS
--> NEEDS: 3 SUBREQMNTS

- 1) TAKE ALL OF THE FOLLOWING
COURSE LIST: ECON 004 P N G489
- 2) TAKE 9 CREDITS IN NATURAL SCIENCES
**CREDITS MAY ALSO APPLY TO GENERAL EDUCATION**
NEEDS: 9.0 CREDITS
COURSE LIST: EARTH100,101,103,111,150 ECEE 101,102 ECEE 120 GEOG 110,115 GEOSC002,010,020,
GEOSCI021,040 MATSE081 METEO003,101
- 3) TAKE 9 CREDITS IN ENVIRONMENTAL COURSES
NEEDS: 9.0 CREDITS
COURSE LIST: CED 404 ECON 428,490 CED 429,431W
GEOG 402,430,431,444,493C GEOSC402Y,454
METH0473 PL SC490
NO GENERAL EDUCATION REQUIREMENTS
--> NEEDS: 10 SUBREQMNTS
- 1) TAKE ENGL 015 OR 030 (3 CREDITS)
- 2) TAKE ENGL 202 (3 CREDITS)
- 3) TAKE CAS 100 (3 CREDITS)
- 4) TAKE 3 CREDITS IN QUANTIFICATION (GQ) - SELECT FROM
   MATHEMATICS, APPLIED MATHEMATICS OR STATISTICS
- 5) TAKE 3 CREDITS IN QUANTIFICATION (GQ) - SELECT FROM ANY
   QUANTIFICATION AREA
- 6) TAKE 9 CREDITS IN NATURAL SCIENCES (GN)
- 7) TAKE 6 CREDITS IN ARTS (GA)
- 8) TAKE 6 CREDITS IN HUMANITIES (GH)
- 9) TAKE 6 CREDITS IN SOCIAL & BEHAVIORAL SCIENCES (GS)
- 10) TAKE 3 CREDITS IN HEALTH AND PHYSICAL ACTIVITY (GHA)

OTHER COURSES
FOREIGN/SECOND LANGUAGE ADMISSION REQUIREMENT
NO FIRST-YEAR SEMINAR
TAKE 1 CREDIT MINIMUM IN FIRST-YEAR SEMINAR

NO WRITING ACROSS THE CURRICULUM
TAKE 3 CREDITS IN 'W' SUFFIX COURSES FROM YOUR COLLEGE

NO UNITED STATES CULTURES AND INTERNATIONAL CULTURES (US/IL)
--> NEEDS: 2 SUBREQMNTS
- 1) TAKE 3 CREDITS IN UNITED STATES CULTURES (US)
- 2) TAKE 3 CREDITS IN INTERNATIONAL CULTURES (IL)

NO GENERAL GRADUATION REQUIREMENTS - SENATE POLICY 83-80
- 1) AT LEAST 36 OF THE LAST 60 CREDITS MUST BE
   EARNED AT PENN STATE
   NEEDS: 36.0 CREDITS
- 2) AT LEAST 60 CREDITS MUST BE EARNED IN LAST FIVE YEARS
   NEEDS: 60.0 CREDITS

NO MINIMUM 2.00 CUMULATIVE GRADE POINT AVERAGE REQUIRED FOR
GRADUATION - SENATE POLICY 82-40

NO MINIMUM 120.0 CREDITS REQUIRED FOR GRADUATION
--> NEEDS: 120.0 CREDITS

LEGEND
NO Requirement not completed
OK Requirement completed
IP Requirement in-progress, OK when satisfactorily completed
\(\lor\) One requirement/subrequirement of group needs to be completed
- Subrequirement not completed
+ Subrequirement completed or in-progress
* Subrequirement not required, but courses apply
RG Registered course
SH Scheduled course
TR Transfer course
IL Independent Learning course, in-progress
PA Portfolio assessment course
LD Late dropped course
\(>\) Repeateable course, counts more than once
\(\geq\) Duplicate course, counts once
\(>\) Credits split between two or more requirements
\(>\) Credit limit for repeat course exceeded

********************* END OF ANALYSIS *********************
ENERGY BUSINESS AND FINANCE GEOGRAPHIC INFORMATION SYSTEMS OPTION

DEGREE AUDIT

MAJOR/OPTION REQUIREMENTS

AUDIT CODE:  B S  EBF  GIS

PENN STATE DEGREE AUDIT REPORT

ENERGY, BUSINESS AND FINANCE-GEOPHYSICAL INFORMATION SYSTEMS OPTN

AT LEAST ONE REQUIREMENT HAS NOT BEEN SATISFIED

GRADES FOR FALL SEMESTER 2009

CURRENT SCHEDULE

NO MAJOR REQUIREMENTS

--> NEEDS: 7 SUBREQMNTS

  1) TAKE ALL OF THE FOLLOWING
     **C OR HIGHER GRADE REQUIRED**
     **CREDITS MAY ALSO APPLY TO GENERAL EDUCATION**
     COURSE LIST: ECON 002 ,302   E B F200   MATH 140 ,141

  2) TAKE THE FOLLOWING
     **CREDITS MAY ALSO APPLY TO GENERAL EDUCATION**
     NEEDS: 3.0 CREDITS
     COURSE LIST: EM SC100S

  3) TAKE 6 CREDITS IN COMPOSITION/WRITING
     **CREDITS MAY ALSO APPLY TO GENERAL EDUCATION**
     NEEDS: 6.0 CREDITS
     COURSE LIST: ENGL 015  OR 030 ,202C OR 202D

  4) TAKE 3 CREDITS IN COMPUTER SCIENCE
     **0-3 CREDITS MAY ALSO APPLY TO GENERAL EDUCATION**
     NEEDS: 3.0 CREDITS
     COURSE LIST: CMPSC101 ,200 ,201 ,202   EM SC468

  5) TAKE ALL OF THE FOLLOWING
     **C OR HIGHER REQ'D IN EBF 401 & ENNEC 484**
     COURSE LIST: ACCTG211   E B F301 ,304W,401 ,473
                 ENNEC484   I B 303   INS 301

  6) TAKE 3-4 CREDITS IN LEGAL BUSINESS ENVIRONMENT
     NEEDS: 3.0 CREDITS
     COURSE LIST: B A 243   B LAW243   E R M411

  7) TAKE 3 CREDITS IN STATISTICS
     **0-3 CREDITS MAY ALSO APPLY TO GENERAL EDUCATION**
     NEEDS: 3.0 CREDITS
     COURSE LIST: E B F472   STAT 301 ,401

NO OPTION REQUIREMENTS

--> NEEDS: 4 SUBREQMNTS

  1) TAKE ALL OF THE FOLLOWING
     **C OR HIGHER GRADE REQUIRED IN GEOG 126 & 160**
     COURSE LIST: GEOG 126 ,160 ,363

  2) TAKE 3 CREDITS IN CARTOGRAPHY & SPATIAL ANALYSIS
     NEEDS: 3.0 CREDITS
     COURSE LIST: GEOG 361 ,362 ,464

  3) TAKE 9 CREDITS IN 400-LEVEL GEOGRAPHIC INFO SYSTEMS
     NEEDS: 9.0 CREDITS
     COURSE LIST: GEOG 461W,463 ,464 ,467 ,468 ,485

  4) TAKE 6 CREDITS IN NATURAL SCIENCES
     **CREDITS MAY ALSO APPLY TO GENERAL EDUCATION**
     NEEDS: 6.0 CREDITS
     COURSE LIST: EARTH100 ,101 ,103 ,111 ,150   EGEE 101 ,
                 EGEE 102 ,120   GEOG 110 ,115   GEOSC002 ,010 ,020 ,
                 GEOSC021 ,040   MATSE081   METEO003 ,101
GENERAL EDUCATION REQUIREMENTS

NEEDS: 10 SUBREQMNTS
- 1) TAKE ENGL 015 OR 030 (3 CREDITS)
- 2) TAKE ENGL 202 (3 CREDITS)
- 3) TAKE CAS 100 (3 CREDITS)
- 4) TAKE 3 CREDITS IN QUANTIFICATION (GQ) - SELECT FROM MATHEMATICS, APPLIED MATHEMATICS OR STATISTICS
- 5) TAKE 3 CREDITS IN QUANTIFICATION (GQ) - SELECT FROM ANY QUANTIFICATION AREA
- 6) TAKE 9 CREDITS IN NATURAL SCIENCES (GN)
- 7) TAKE 6 CREDITS IN ARTS (GA)
- 8) TAKE 6 CREDITS IN HUMANITIES (GH)
- 9) TAKE 6 CREDITS IN SOCIAL & BEHAVIORAL SCIENCES (GS)
- 10) TAKE 3 CREDITS IN HEALTH AND PHYSICAL ACTIVITY (GHA)

OTHER COURSES

FOREIGN/SECOND LANGUAGE ADMISSION REQUIREMENT

NEEDS: 2 SUBREQMNTS
- 1) TAKE 3 CREDITS IN UNITED STATES CULTURES (US)
- 2) TAKE 3 CREDITS IN INTERNATIONAL CULTURES (IL)

GENERAL GRADUATION REQUIREMENTS - SENATE POLICY 83-80

- 1) AT LEAST 36 OF THE LAST 60 CREDITS MUST BE EARNED AT PENN STATE
   NEEDS: 36.0 CREDITS
- 2) AT LEAST 60 CREDITS MUST BE EARNED IN LAST FIVE YEARS
   NEEDS: 60.0 CREDITS

MINIMUM 2.00 CUMULATIVE GRADE POINT AVERAGE REQUIRED FOR GRADUATION - SENATE POLICY 82-40

MINIMUM 120.0 CREDITS REQUIRED FOR GRADUATION

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**LEGEND**

NO  Requirement not completed
OK  Requirement completed
IP  Requirement in-progress, OK when satisfactorily completed
OR  One requirement/subrequirement of group needs to be completed
  - Subrequirement not completed
  + Subrequirement completed or in-progress
  * Subrequirement not required, but courses apply
RG  Registered course
SP  Scheduled course
TR  Transfer course
IL  Independent Learning course, in-progress
PA  Portfolio assessment course
LD  Late dropped course
>  Repeatable course, counts more than once
≥  Duplicate course, counts once
>  Credits split between two or more requirements
≤  Credit limit for repeat course exceeded

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END OF ANALYSIS

48
ENERGY ENGINEERING (EN ENG) DEGREE AUDIT
PREPARED: 08/13/07 - 15:01                          EM EN ENG
PREPARED: 05/24/10 - 08:43                          EM ENENG
MAJOR/OPTION REQUIREMENTS
AUDIT CODE:   B S ENENG                     PROGRAM YEAR: 2010
---- PENNS STATE DEGREE AUDIT REPORT
BACHELOR OF SCIENCE
ENERGY ENGINEERING
------------------------------------------------------------------
AT LEAST ONE REQUIREMENT HAS NOT BEEN SATISFIED
------------------------------------------------------------------
GRADES FOR SPRING SEMESTER 2010
------------------------------------------------------------------
CURRENT SCHEDULE
------------------------------------------------------------------
NO MAJOR REQUIREMENTS
--> NEEDS:                           12 SUBREQMNTS
------------------------------------------------------------------
- 1) TAKE 3 CREDITS IN COMPOSITION
   **CREDITS MAY ALSO APPLY TO GENERAL EDUCATION**
   NEEDS:    3.0 CREDITS
   COURSE LIST: ENGL 015 ,030
- 2) TAKE THE FOLLOWING
   **CREDITS MAY ALSO APPLY TO GENERAL EDUCATION**
   COURSE LIST: EM SC100S
- 3) TAKE ALL OF THE FOLLOWING
   **CREDITS MAY ALSO APPLY TO GENERAL EDUCATION**
   COURSE LIST: CHEM 110 ,111 ,112 MATH 140 ,141
                PHYS 211 ,212 ENGL 202C PHIL 103
- 4) TAKE 3 CREDITS IN ECONOMICS
   **CREDITS MAY ALSO APPLY TO GENERAL EDUCATION**
   NEEDS:    3.0 CREDITS
   COURSE LIST: ECON 002 ,014 E B F200
- 5) TAKE ALL OF THE FOLLOWING
   NEEDS:   12.0 CREDITS
   COURSE LIST: CHEM 210 E E 211 MATH 231 ,251
- 6) TAKE 3 CREDITS IN COMPUTER SCIENCE
   NEEDS:    3.0 CREDITS
   COURSE LIST: CMPSC201 ,202 EM SC468
- 7) TAKE ALL OF THE FOLLOWING
   **C OR HIGHER GRADE REQUIRED**
   NEEDS:   32.0 CREDITS
   COURSE LIST: EME 301 ,303 EGEE 302 ,304 ,420 ,430 ,
                EGEE 438 ,441 ,451 ,464W,494
- 8) TAKE ALL OF THE FOLLOWING
   COURSE LIST: EGEE 012 ,437 F SC 431 ,432 MATSE201
- 9) TAKE 3 CREDITS IN ENGINEERING ECONOMY OR EVALUATION
   NEEDS:    3.0 CREDITS
   COURSE LIST: I E 302 P N G489
- 10) TAKE 3 CREDITS IN EGEE ELECTIVES FROM APPROVED LIST
    NEEDS:    3.0 CREDITS
- 11) TAKE 6 CREDITS OF PROFESSIONAL ELECTIVES FROM APPR LIST
    NEEDS:    6.0 CREDITS
- 12) TAKE 6 CREDITS IN TECHNICAL ELECTIVES FROM APPR LIST
    NEEDS:    6.0 CREDITS

49
NO GENERAL EDUCATION REQUIREMENTS
--> NEEDS: 10 SUBREQMNTS
- 1) TAKE ENGL 015 OR 030 (3 CREDITS)
- 2) TAKE ENGL 202 (3 CREDITS)
- 3) TAKE CAS 100 (3 CREDITS)
- 4) TAKE 3 CREDITS IN QUANTIFICATION (GQ) - SELECT FROM
   MATHEMATICS, APPLIED MATHEMATICS OR STATISTICS
- 5) TAKE 3 CREDITS IN QUANTIFICATION (GQ) - SELECT FROM ANY
   QUANTIFICATION AREA
- 6) TAKE 9 CREDITS IN NATURAL SCIENCES (GN)
- 7) TAKE 6 CREDITS IN ARTS (GA)
- 8) TAKE 6 CREDITS IN HUMANITIES (GH)
- 9) TAKE 6 CREDITS IN SOCIAL & BEHAVIORAL SCIENCES (GS)
- 10) TAKE 3 CREDITS IN HEALTH AND PHYSICAL ACTIVITY (GHA)

-----------------------------------------------------------------
OTHER COURSES
-----------------------------------------------------------------
FOREIGN/SECOND LANGUAGE ADMISSION REQUIREMENT
-----------------------------------------------------------------
NO FIRST-YEAR SEMINAR
TAKE 1 CREDIT MINIMUM IN FIRST-YEAR SEMINAR
-----------------------------------------------------------------
NO WRITING ACROSS THE CURRICULUM
TAKE 3 CREDITS IN 'W' SUFFIX COURSES FROM YOUR COLLEGE
-----------------------------------------------------------------
NO UNITED STATES CULTURES AND INTERNATIONAL CULTURES (US/IL)
--> NEEDS: 2 SUBREQMNTS
- 1) TAKE 3 CREDITS IN UNITED STATES CULTURES (US)
- 2) TAKE 3 CREDITS IN INTERNATIONAL CULTURES (IL)
-----------------------------------------------------------------
NO GENERAL GRADUATION REQUIREMENTS - SENATE POLICY 83-80
- 1) AT LEAST 36 OF THE LAST 60 CREDITS MUST BE
   EARNED AT PENN STATE
   NEEDS: 36.0 CREDITS
- 2) AT LEAST 60 CREDITS MUST BE EARNED IN LAST FIVE YEARS
   NEEDS: 60.0 CREDITS
-----------------------------------------------------------------
NO MINIMUM 2.00 CUMULATIVE GRADE POINT AVERAGE REQUIRED FOR
GRADUATION - SENATE POLICY 82-40

NO MINIMUM 130.0 CREDITS REQUIRED FOR GRADUATION
--> NEEDS: 130.0 CREDITS

LEGEND
NO Requirement not completed
OK Requirement completed
IP Requirement in-progress, OK when satisfactorily completed
OR One requirement/subrequirement of group needs to be completed
- Subrequirement not completed
+ Subrequirement completed or in-progress
* Subrequirement not required, but courses apply
RG Registered course
SF/S Scheduled course
TR Transfer course
IL Independent Learning course, in-progress
PA Portfolio assessment course
LD Late dropped course
>Y Repeatable course, counts more than once
>2 Duplicate course, counts once
>3 Credits split between two or more requirements
>Y Credit limit for repeat course exceeded

********************* END OF ANALYSIS *********************
ENVIRONMENTAL SYSTEMS ENGINEERING (ENVSE) OPTION DEGREE AUDIT

PREPARED: 05/11/10 - 10:27

MAJOR/OPTION REQUIREMENTS

AUDIT CODE: B S ENVSE
Program Year: 2010

Penn State Degree Audit Report
Bachelor of Science
Environmental Systems Engineering-Environs Systems Engr Option

At least one requirement has not been satisfied

Grades for Fall Semester 2009

Current Schedule

No Major Requirements

-- Needs: 11 Subreqmnts

1) Take all of the following
   **24 credits may also apply to general education**
   **C or higher grade required in ENGL 202C**
   Course List: CHEM 110 or 106, 111, 112, MATH 140, 141, ENGL 202C, PHYS 211, 212

2) Take the following
   **Credits may also apply to general education**
   Course List: EM 2100S

3) Take 3 credits in composition
   **Credits may also apply to general education**
   Needs: 3.0 credits
   Course List: ENGL 015 or 030

4) Take 2 credits in calculus
   **Credits may also apply to general education**
   Needs: 2.0 credits
   Course List: MATH 220, 231

5) Take 3-4 credits in Computer Science
   Needs: 3.0 credits
   Course List: CMPSC201, 202, 203

6) Take 4 credits in Differential Equations
   Course List: MATH 251

7) Take 3 credits in Physical Geology
   **C or higher grade required in GEOSC 071**
   Needs: 3.0 credits
   Course List: GEOSC001, 071

8) Take all of the following
   Course List: CHEM 202, EMCH211, 212

9) Take all of the following
   **C or higher grade required**
   Course List: C E 370, EM 301, 303, GEOEE427, MN PR301

10) Take all of the following
    Course List: GEOE404W, 406, 480, GEOE452, I H S450

11) Take 9 credits in related areas - see advisor
    Needs: 9.0 credits

-----------------------------------------------------------------

No Option Requirements

-- Needs: 5 Subreqmnts

1) Take all of the following
   **Credits may also apply to general education**
   Course List: GEOG 030, MICRB106

2) Take all of the following
   Course List: EGE 470, GEOE412, MNG 401, P N G411

3) Take 3 credits from the following
   Needs: 3.0 credits
   Course List: GEOSC413W, METEO455, SOILS401

4) Take 3 credits from the following
    Needs: 3.0 credits
    Course List: METEO454, MN PR401, 426

5) Take 3 credits from the following
    Needs: 3.0 credits
    Course List: GEOE408, M E 433, MN PR425

-----------------------------------------------------------------
NO GENERAL EDUCATION REQUIREMENTS
--> NEEDS: 10 SUBREQMNTS
- 1) TAKE ENGL 015 OR 030 (3 CREDITS)
- 2) TAKE ENGL 202 (3 CREDITS)
- 3) TAKE CAS 100 (3 CREDITS)
- 4) TAKE 3 CREDITS IN QUANTIFICATION (GQ) - SELECT FROM MATHEMATICS, APPLIED MATHEMATICS OR STATISTICS
- 5) TAKE 3 CREDITS IN QUANTIFICATION (GQ) - SELECT FROM ANY QUANTIFICATION AREA
- 6) TAKE 9 CREDITS IN NATURAL SCIENCES (GN)
- 7) TAKE 6 CREDITS IN ARTS (GA)
- 8) TAKE 6 CREDITS IN HUMANITIES (GH)
- 9) TAKE 6 CREDITS IN SOCIAL & BEHAVIORAL SCIENCES (GS)
- 10) TAKE 3 CREDITS IN HEALTH AND PHYSICAL ACTIVITY (GHA)

OTHER COURSES

FOREIGN/SECOND LANGUAGE ADMISSION REQUIREMENT

NO FIRST-YEAR SEMINAR
TAKE 1 CREDIT MINIMUM IN FIRST-YEAR SEMINAR

NO WRITING ACROSS THE CURRICULUM
TAKE 3 CREDITS IN 'W' SUFFIX COURSES FROM YOUR COLLEGE

NO UNITED STATES CULTURES AND INTERNATIONAL CULTURES (US/IL)
--> NEEDS: 2 SUBREQMNTS
- 1) TAKE 3 CREDITS IN UNITED STATES CULTURES (US)
- 2) TAKE 3 CREDITS IN INTERNATIONAL CULTURES (IL)

NO GENERAL GRADUATION REQUIREMENTS - SENATE POLICY 83-80
- 1) AT LEAST 36 OF THE LAST 60 CREDITS MUST BE EARNED AT PENN STATE
   NEEDS: 36.0 CREDITS
- 2) AT LEAST 60 CREDITS MUST BE EARNED IN LAST FIVE YEARS
   NEEDS: 60.0 CREDITS

NO MINIMUM 2.00 CUMULATIVE GRADE POINT AVERAGE REQUIRED FOR GRADUATION - SENATE POLICY 82-40

NO MINIMUM 131.0 CREDITS REQUIRED FOR GRADUATION
--> NEEDS: 131.0 CREDITS

LEGEND
NO  Requirement not completed
OK  Requirement completed
IP  Requirement in-progress, OK when satisfactorily completed
OR  One requirement/subrequirement of group needs to be completed
  - Subrequirement not completed
  + Subrequirement completed or in-progress
  * Subrequirement not required, but courses apply
RG  Registered course
SH  Scheduled course
TR  Transfer course
IL  Independent Learning course, in-progress
PA Portfolio assessment course
LD  Late dropped course
>R Repeatable course, counts more than once
>2 Duplicate course, counts once
>S Credits split between two or more requirements
>Y Credit limit for repeat course exceeded

************************** END OF ANALYSIS **************************
ENVIRONMENTAL HEALTH AND SAFETY ENGINEERING (EHSE) OPTION DEGREE AUDIT

PREPARED: 04/21/09 - 09:55                   EM ENVSE
MAJOR/OPTION REQUIREMENTS
AUDIT CODE:   B S ENVSEENVS                 PROGRAM YEAR: 2009
 PENN STATE DEGREE AUDIT REPORT
BACHELOR OF SCIENCE
ENVIRONMENTAL SYSTEMS ENGINEERING-ENVIRON HLTH & SAFETY ENGR OPTN

-----------------------------------------------------------------

AT LEAST ONE REQUIREMENT HAS NOT BEEN SATISFIED

-----------------------------------------------------------------

GRADES FOR FALL SEMESTER 2008

-----------------------------------------------------------------

CURRENT SCHEDULE

-----------------------------------------------------------------

** GRADE POINT AVERAGE FOR THE MAJOR **

-----------------------------------------------------------------

NO MAJOR REQUIREMENTS
--> NEEDS:                           10 SUBREQMNTS

- 1) TAKE ALL OF THE FOLLOWING
   **24 CREDITS MAY ALSO APPLY TO GENERAL EDUCATION**
   **C OR HIGHER GRADE REQUIRED IN ENGL 202C**
   COURSE LIST: CHEM 110  OR 106 ,112 ,111   EM SC100S
                MATH 140 ,141   ENGL 202C  PHYS 211 ,212
- 2) TAKE 3 CREDITS IN COMPOSITION
   **CREDITS MAY ALSO APPLY TO GENERAL EDUCATION**
   NEEDS:    3.0 CREDITS
   COURSE LIST: ENGL 015  OR 030
- 3) TAKE 2 CREDITS IN CALCULUS
   **CREDITS MAY ALSO APPLY TO GENERAL EDUCATION**
   NEEDS:    2.0 CREDITS
   COURSE LIST: MATH 220 ,231
- 4) TAKE 3-4 CREDITS IN COMPUTER SCIENCE
   NEEDS:    3.0 CREDITS
   COURSE LIST: CMPSC201 ,202 ,203
- 5) TAKE 4 CREDITS IN DIFFERENTIAL EQUATIONS
   COURSE LIST: MATH 251
- 6) TAKE 3 CREDITS IN PHYSICAL GEOLOGY
   **C OR HIGHER GRADE REQUIRED IN GEOSC 071**
   NEEDS:    3.0 CREDITS
   COURSE LIST: GEOSC001 ,071
- 7) TAKE ALL OF THE FOLLOWING
   COURSE LIST: CHEM 202 E MCH211 ,212
- 8) TAKE ALL OF THE FOLLOWING
   **C OR HIGHER GRADE REQUIRED**
   COURSE LIST: C E 370  GEOEE427  MN PR301
- 9) TAKE ALL OF THE FOLLOWING
   COURSE LIST: EGEE 301  GEOEE404W,406 ,480  GEOSC452
                I H S450
- 10) TAKE 9 CREDITS IN RELATED AREAS - SEE ADVISOR
     NEEDS:    9.0 CREDITS

-----------------------------------------------------------------

NO OPTION REQUIREMENTS
--> NEEDS:                           2 SUBREQMNTS

- 1) TAKE ALL OF THE FOLLOWING
   **CREDITS MAY ALSO APPLY TO GENERAL EDUCATION**
   COURSE LIST: BIOL 141 PSYCH100
- 2) TAKE ALL OF THE FOLLOWING
   COURSE LIST: I H S400 ,447 ,470 ,495W  M E 405

-----------------------------------------------------------------
NO GENERAL EDUCATION REQUIREMENTS
--> NEEDS: 10 SUBREQMNTS
- 1) TAKE ENGL 015 OR 030 (3 CREDITS)
- 2) TAKE ENGL 202 (3 CREDITS)
- 3) TAKE CAS 100 (3 CREDITS)
- 4) TAKE 3 CREDITS IN QUANTIFICATION (GQ) - SELECT FROM
   MATHEMATICS, APPLIED MATHEMATICS OR STATISTICS
- 5) TAKE 3 CREDITS IN QUANTIFICATION (GQ) - SELECT FROM ANY
   QUANTIFICATION AREA
- 6) TAKE 9 CREDITS IN NATURAL SCIENCES (GN)
- 7) TAKE 6 CREDITS IN ARTS (GA)
- 8) TAKE 6 CREDITS IN HUMANITIES (GH)
- 9) TAKE 6 CREDITS IN SOCIAL & BEHAVIORAL SCIENCES (GS)
- 10) TAKE 3 CREDITS IN HEALTH AND PHYSICAL ACTIVITY (GHA)

OTHER COURSES

FOREIGN/SECOND LANGUAGE ADMISSION REQUIREMENT

NO FIRST-YEAR SEMINAR
TAKE 1 CREDIT MINIMUM IN FIRST-YEAR SEMINAR

NO WRITING ACROSS THE CURRICULUM
TAKE 3 CREDITS IN 'W' SUFFIX COURSES FROM YOUR COLLEGE

NO UNITED STATES CULTURES AND INTERNATIONAL CULTURES (US/IL)
--> NEEDS: 2 SUBREQMNTS
- 1) TAKE 3 CREDITS IN UNITED STATES CULTURES (US)
- 2) TAKE 3 CREDITS IN INTERNATIONAL CULTURES (IL)

NO GENERAL GRADUATION REQUIREMENTS - SENATE POLICY 83-80
- 1) AT LEAST 36 OF THE LAST 60 CREDITS MUST BE
   EARNED AT PENN STATE
   NEEDS: 36.0 CREDITS
- 2) AT LEAST 60 CREDITS MUST BE EARNED IN LAST FIVE YEARS
   NEEDS: 60.0 CREDITS

NO MINIMUM 2.00 CUMULATIVE GRADE POINT AVERAGE REQUIRED FOR
GRADUATION - SENATE POLICY 82-40

NO MINIMUM 129.0 CREDITS REQUIRED FOR GRADUATION
--> NEEDS: 129.0 CREDITS

LEGEND
NO Requirement not completed
OK Requirement completed
IP Requirement in-progress, OK when satisfactorily completed
OR One requirement/subrequirement of group needs to be completed
- Subrequirement not completed
+ Subrequirement completed or in-progress
* Subrequirement not required, but courses apply
RG Registered course
SP/ Scheduled course
TR Transfer course
IL Independent Learning course, in-progress
PA Portfolio assessment course
LD Late dropped course
> Repeateable course, counts more than once
>= Duplicate course, counts once
> Credit split between two or more requirements
>¥ Credit limit for repeat course exceeded

*************** END OF ANALYSIS ***************
MINING ENGINEERING (MNG E) DEGREE AUDIT
PREPARED: 08/13/07 - 15:01  EM MNG E
MAJOR/OPTION REQUIREMENTS
AUDIT CODE:   B S EBF                       PROGRAM YEAR: 2007
PENN STATE DEGREE AUDIT REPORT
BACHELOR OF SCIENCE
ENERGY, BUSINESS AND FINANCE-GENERAL OPTION

PROGRAM INFORMATION

AT LEAST ONE REQUIREMENT HAS NOT BEEN SATISFIED

GRADES FOR SPRING SEMESTER 2007

CURRENT SCHEDULE

GPA FOR MAJOR

NO MAJOR REQUIREMENTS
--> NEEDS:  11 SUBREQMNTS
- 1) TAKE ALL OF THE FOLLOWING
  **18 CREDITS MAY ALSO APPLY TO GENERAL EDUCATION**
  COURSE LIST: CHEM 110 OR 106,111  ECON 002
  EM SC100S  MATH 140,141  PHYS 211,212,213
  STAT 301
- 2) TAKE 3 CREDITS IN COMPOSITION (CATEGORY A)
  **CREDITS MAY ALSO APPLY TO GENERAL EDUCATION**
  COURSE LIST: ENGL 015,030
- 3) TAKE 3 CREDITS IN PHILOSOPHY (CATEGORY B)
  **CREDITS MAY ALSO APPLY TO GENERAL EDUCATION**
  COURSE LIST: PHIL 103,106,107,233 OR S T S233
- 4) TAKE 3 CREDITS IN COMPUTER SCIENCE (CATEGORY C)
  COURSE LIST: CMPSC201,202
- 5) TAKE 2 CREDITS IN INTERMEDIATE CALCULUS (CATEGORY D)
  COURSE LIST: MATH 220,231
- 6) TAKE 3 CREDITS IN ENGINEERING MECHANICS (CATEGORY E)
  COURSE LIST: E MCH012,112H
- 7) TAKE 3 CREDITS IN DIFFERENTIAL EQUATIONS
  COURSE LIST: MATH 250
- 8) TAKE THE FOLLOWING
  COURSE LIST: E MCH210
- 9) TAKE ALL OF THE FOLLOWING
  **C OR HIGHER GRADE REQUIRED**
  COURSE LIST: GEOSCO71  MNG 030,441,451W  MN PR413, MN PR301
- 10) TAKE ALL OF THE FOLLOWING
  COURSE LIST: A E 401  C E 360  EDSGN100  GEOSC201
  M E 300  MNG 023,402,404,410,411,412,422, MNG 431
- 11) TAKE 6 CREDITS IN MINING TECHNICAL SELECTIONS
  NEEDS:  6.0 CREDITS

-----------------------------------------------------------------
GENERAL EDUCATION REQUIREMENTS

--> NEEDS: 10 SUBREQMNTS
- 1) TAKE ENGL 015 OR 030 (3 CREDITS)
- 2) TAKE ENGL 202 (3 CREDITS)
- 3) TAKE CAS 100 (3 CREDITS)
- 4) TAKE 3 CREDITS IN QUANTIFICATION (GQ) - SELECT FROM MATHEMATICS, APPLIED MATHEMATICS OR STATISTICS
- 5) TAKE 3 CREDITS IN QUANTIFICATION (GQ) - SELECT FROM ANY QUANTIFICATION AREA
- 6) TAKE 9 CREDITS IN NATURAL SCIENCES (GN)
- 7) TAKE 6 CREDITS IN ARTS (GA)
- 8) TAKE 6 CREDITS IN HUMANITIES (GH)
- 9) TAKE 6 CREDITS IN SOCIAL & BEHAVIORAL SCIENCES (GS)
- 10) TAKE 3 CREDITS IN HEALTH AND PHYSICAL ACTIVITY (GHA)

OTHER COURSES

FOREIGN/SECOND LANGUAGE ADMISSION REQUIREMENT

NO FIRST-YEAR SEMINAR
TAKE 1 CREDIT MINIMUM IN FIRST-YEAR SEMINAR

NO WRITING ACROSS THE CURRICULUM
TAKE 3 CREDITS IN 'W' SUFFIX COURSES FROM YOUR COLLEGE

NO UNITED STATES CULTURES AND INTERNATIONAL CULTURES (US/IL)

--> NEEDS: 2 SUBREQMNTS
- 1) TAKE 3 CREDITS IN UNITED STATES CULTURES (US)
- 2) TAKE 3 CREDITS IN INTERNATIONAL CULTURES (IL)

NO GENERAL GRADUATION REQUIREMENTS - SENATE POLICY 83-80

- 1) AT LEAST 36 OF THE LAST 60 CREDITS MUST BE EARNED AT PENN STATE
NEEDS: 36.0 CREDITS
- 2) AT LEAST 60 CREDITS MUST BE EARNED IN LAST FIVE YEARS
NEEDS: 60.0 CREDITS

NO MINIMUM 2.00 CUMULATIVE GRADE POINT AVERAGE REQUIRED FOR GRADUATION - SENATE POLICY 82-40

NO MINIMUM 130.0 CREDITS REQUIRED FOR GRADUATION

--> NEEDS: 130.0 CREDITS

LEGEND
NO  Requirement not completed
OK  Requirement completed
IP  Requirement in-progress, OK when satisfactorily completed
OR  One requirement/subrequirement of group needs to be completed
+  Subrequirement not completed
>  Subrequirement completed or in-progress
*  Subrequirement not required, but courses apply
RG  Registered course
SF  Scheduled course
TR  Transfer course
IL  Independent Learning course, in-progress
PA  Portfolio assessment course
LD  Late dropped course
>Y  Repeatable course, counts more than once
>Y  Credits split between two or more requirements
>Y  Credit limit for repeat course exceeded

******************** END OF ANALYSIS *********************
PETROLEUM AND NATURAL GAS ENGINEERING (PNG E) DEGREE AUDIT
PREPARED: 08/13/07 - 15:01                          EM PNG E
MAJOR/OPTION REQUIREMENTS
AUDIT CODE: B S EBF PROGRAM YEAR: 2007
PENN STATE DEGREE AUDIT REPORT
BACHELOR OF SCIENCE
ENERGY, BUSINESS AND FINANCE-GENERAL OPTION

PROGRAM INFORMATION

AT LEAST ONE REQUIREMENT HAS NOT BEEN SATISFIED

GRADES FOR SPRING SEMESTER 2007

CURRENT SCHEDULE

GPA FOR MAJOR

NO MAJOR REQUIREMENTS
--> NEEDS: 11 SUBREQMNTS
- 1) TAKE ALL OF THE FOLLOWING
  **24 CREDITS MAY ALSO APPLY TO GENERAL EDUCATION**
  COURSE LIST: CHEM 110 OR 106,112,111 ECON 002
  ENGL 202C EM SC100S MATH 140,141 PHYS 211,212,213
- 2) TAKE 3 CREDITS IN COMPOSITION
  **CREDITS MAY ALSO APPLY TO GENERAL EDUCATION**
  NEEDS: 3.0 CREDITS
  COURSE LIST: ENGL 015,030
- 3) TAKE 3 CREDITS IN PHILOSOPHY
  **CREDITS MAY ALSO APPLY TO GENERAL EDUCATION**
  NEEDS: 3.0 CREDITS
  COURSE LIST: PHIL 103,106,107,233
- 4) TAKE THE FOLLOWING
  COURSE LIST: E MCH210
- 5) TAKE THE FOLLOWING
  COURSE LIST: MATH 230
- 6) TAKE THE FOLLOWING
  COURSE LIST: MATH 251
- 7) TAKE 3 CREDITS IN COMPUTER SCIENCES
  NEEDS: 3.0 CREDITS
  COURSE LIST: CMPSC201,202
- 8) TAKE ALL OF THE FOLLOWING
  COURSE LIST: E MCH012 EME 301,303, GEOSC001,454
- 9) TAKE ALL OF THE FOLLOWING
  **C OR HIGHER GRADE REQUIRED**
  COURSE LIST: P N G405,406,410,450,451,475
- 10) TAKE ALL OF THE FOLLOWING
  COURSE LIST: P N G420,425,430,440W,480,482,489,
  P N G490,491,492
- 11) TAKE 6 CREDITS IN RELATED AREAS - SEE ADVISOR
  NEEDS: 6.0 CREDITS
NO  GENERAL EDUCATION REQUIREMENTS
--> NEEDS: 10 SUBREQMNTS
   - 1) TAKE ENGL 015 OR 030 (3 CREDITS)
   - 2) TAKE ENGL 202 (3 CREDITS)
   - 3) TAKE CAS 100 (3 CREDITS)
   - 4) TAKE 3 CREDITS IN QUANTIFICATION (GQ) - SELECT FROM MATHEMATICS, APPLIED MATHEMATICS OR STATISTICS
   - 5) TAKE 3 CREDITS IN QUANTIFICATION (GQ) - SELECT FROM ANY QUANTIFICATION AREA
   - 6) TAKE 9 CREDITS IN NATURAL SCIENCES (GN)
   - 7) TAKE 6 CREDITS IN ARTS (GA)
   - 8) TAKE 6 CREDITS IN HUMANITIES (GH)
   - 9) TAKE 6 CREDITS IN SOCIAL & BEHAVIORAL SCIENCES (GS)
   - 10) TAKE 3 CREDITS IN HEALTH AND PHYSICAL ACTIVITY (GHA)

OTHER COURSES

FOREIGN/SECOND LANGUAGE ADMISSION REQUIREMENT

NO  FIRST-YEAR SEMINAR
TAKE 1 CREDIT MINIMUM IN FIRST-YEAR SEMINAR

NO  WRITING ACROSS THE CURRICULUM
TAKE 3 CREDITS IN 'W' SUFFIX COURSES FROM YOUR COLLEGE

NO  UNITED STATES CULTURES AND INTERNATIONAL CULTURES (US/IL)
--> NEEDS: 2 SUBREQMNTS
   - 1) TAKE 3 CREDITS IN UNITED STATES CULTURES (US)
   - 2) TAKE 3 CREDITS IN INTERNATIONAL CULTURES (IL)

NO  GENERAL GRADUATION REQUIREMENTS - SENATE POLICY 83-80
- 1) AT LEAST 36 OF THE LAST 60 CREDITS MUST BE EARNED AT PENN STATE
   NEEDS: 36.0 CREDITS
- 2) AT LEAST 60 CREDITS MUST BE EARNED IN LAST FIVE YEARS
   NEEDS: 60.0 CREDITS

NO  MINIMUM 2.00 CUMULATIVE GRADE POINT AVERAGE REQUIRED FOR GRADUATION - SENATE POLICY 82-40

NO  MINIMUM 129.0 CREDITS REQUIRED FOR GRADUATION
--> NEEDS: 129.0 CREDITS

LEGEND
NO  Requirement not completed
OK  Requirement completed
IP  Requirement in-progress; OK when satisfactorily completed
OR  One requirement/subrequirement of group needs to be completed
   - Subrequirement not completed
   + Subrequirement completed or in-progress
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RG  Registered course
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PA  Portfolio assessment course
LD  Late dropped course
>Y Repeatable course, counts more than once
>2 Duplicate course, counts once
>3 Credits split between two or more requirements
>Y Credit limit for repeat course exceeded

********************* END OF ANALYSIS *********************
SECTION 10: DEPARTMENT FORMS

COURSE PETITION FORM

College of Earth and Mineral Sciences
Request for Exception to Program Requirements

Student's Name

ID Number

Email Address

Local Street Address

Major/Option

Local City & Zip Code

Type of Exception Requested:


(Choose One)

Substitute one specific course for another specific course. (e.g., MATH 257A for MATH 491)

Course student has taken ___________ Semester/Year ___________ Course listed in requirements

Allow a specific course to substitute for any course in a requirement.

Course student has taken ___________ Semester/Year ___________ Requirement

Waive a specific number of credits in a requirement.

Number of credits to waive ___________ Requirement (e.g., Gen Ed Quantification)

Waive a specific course in a requirement.

Course student requests to waive ___________ Requirement (e.g., Prescribed Courses)

Allow requirement to be completed without courses being taken.

Requirement to be waived ___________

Note: Waiving credits does not change the total number of credits required in your major.

3-6-9 Sequence to replace 6-6-6 Arts, Humanities; Social Science Req.
(Specify ALL, GA, GH and GS courses)

Explanation of Request
(Attach official course description if exception involves non-PSU course)

Signatures Required

Student's Signature/Date

Program Chair/Date

Academic Advisor's Signature/Date

**Associate Dean for Education's Signature/Date

**Only needed if General Education Course's are involved in Exception Request

Office use only:
Entered on ARUSDH by: ___________ Date: ___________
Registration Drop/Add Form

Student Name: ___________________________ Student Number: ___________________________

Activity:
Registration: _____ Drop/Add: _____ Late Add: _____ Late Drop: _____

<table>
<thead>
<tr>
<th>Schedule Number</th>
<th>Course Abbrev</th>
<th>Course Number</th>
<th>Section</th>
<th>Credit</th>
<th>Course Abbrev</th>
<th>Course Number</th>
<th>Section</th>
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</tbody>
</table>

Academic Period:
____ Fall  ____ Spring  ____ Summer  Year: ___________________________ Campus: ___________________________

- Students should consult with their academic adviser before making any course changes.
- Dates for the regular course drop/add period can be found on the Academic Calendar located on the Registrar's home page.
- Late course adds and late course registration are those processed after the regular drop/add period end for the semester.
  The late course drop period starts after the drop/add period ends and continues to the published late drop deadline.
  These time frames are proportional for other than fifteen week calendars.
- Section changes can be done through the end of the twentieth week of classes at the department offering the course.
- Students are expected to register before classes begin. Registering late will incur additional fees.
- Starting with the first day of the semester, the semester bill must be paid before any course add can be processed.

Add credits beyond the 19 credit limit: Take this form to the department offering the course for processing.
Student's academic adviser: ___________________________ Date: ___________________________
Graduate students must abide by the credit limits specified in the Graduate Degree Bulletin.

Add a course that is departmentally controlled, or add a course that is full: Take this form to the department offering the course for processing.
Department Approval: ___________________________ Date: ___________________________

To register and add a course after the drop/add period ends: Take this form to either your department or to the Registrar's Office for processing.
Student's academic adviser: ___________________________ Date: ___________________________
Course Instructor Approval: ___________________________ Date: ___________________________
If late adding more than one course, have instructors sign beside appropriate courses on the form.

Late drop a course: Take this form to your department, or to the Registrar's office for processing.
Student's academic adviser: ___________________________ Date: ___________________________
Student Signature: ___________________________ Date: ___________________________
Administrative Course Cancellation

Return To:
Enrollment Services
112 Shields Building
University Park, PA 16802-1271
Fax: 814-863-1929

Purpose: This procedure is provided to resolve a documented registration error and results in the removal of a course(s) from the student’s academic record. This procedure has a time limitation of one semester beyond the semester of the error. Students receiving financial aid will have their aid adjusted if they drop below 12 credits.

To be completed by the student:

Student Name: ___________________________ PSU ID: ___________________________

Course Name & Number: ___________________________
Section: ___________________________
Semester the Course was Scheduled: ___________________________

I certify that I did not attend the course identified on this form.

__________________________  ____________________________  _____________
Student Signature          Telephone Number          Date

To be completed by the instructor:

I certify that I have no record of attendance or evaluation for this student

__________________________  ____________________________  _____________
Instructor Signature       Telephone Number          Date

6/22/06
CHANGE OF MAJOR FORM

COLLEGE OF EARTH & MINERAL SCIENCES
Department Approval to Enter Major
or Enter College of EMS

Today's Date: ____________________________

Student Name: (PRINT CLEARLY) ____________________________

PSU ID #: ____________________________

Local Address: ______________________________________

E-mail Address: (PRINT CLEARLY) ____________________________

Present College: ______________________________________

Present Major: ______________________________________

Major You Wish To Enter: ______________________________________

Option You Wish to Enter (if applicable): ______________________________________

Effective Semester: ______________________________________

By signing my name below, I understand that by changing majors I may need more than eight semesters to graduate. I also verify that all information provided above is true and correct.

Student Signature: ______________________________________

DEPARTMENT USE ONLY

Cumulative GPA: ____________________________

Number of Earned Credits Applicable to New Major: ____________________________

Number of "In Progress" Credits Applicable to New Major: ____________________________

I have spoken with this student and approve this change of major.

PRINT Advisor Name: ____________________________

Advisor Signature: ____________________________

_________________________  ____________________________
Dean/Administrative Officer  Date

Internal Use Only

_________________________  ____________________________
ISIS  LIST-SERV  LAB  DATE

1/1/2008

62
Senior Thesis/Research Project (494) or Independent Studies (496)

Prior permission from a faculty member who will serve as your project advisor must be obtained before registering for either course.

After coordinating this with your advisor, please enter the information below and have the faculty member supervising your project sign the form.

Approved forms are to be returned to 115 Hosler Building as soon as arrangements are completed.

Student Name: _______________________________________

PSU ID Number: ______________________________________

Email Address: ______________________________________

Number of Credits: __________________________________

Course Abbreviation and No.: ____________________________

Research Topic: ______________________________________

Semester: ___________________________________________

Project Advisor’s Printed Name: __________________________

Project Advisor’s Signature: ____________________________

Date: _______________________________________________
SECTION 12: IMPORTANT NUMBERS/ IMPORTANT WEBSITES

**Bursar**- 865-6528
**EMS Student Center**- 865-2751
**Housing and Food Services**- 865-6524
**Penn State General Information Line**- 865-4700
**Registrar**- 865-6357

**EME Undergraduate Office**- 863-5566
**EMS Deans Office**- 865-6546
**Parking Office**- 865-1436

**Closings and Cancellations Due to Weather**- 865-4000  In addition, those with Web access can check the Penn State Home Page at [http://www.psu.edu](http://www.psu.edu) and double click on "Weather Cancellations and Delays" in the "Announcements" box or go directly to Penn State's Public Broadcasting home pages at [http://www.wpsu.org](http://www.wpsu.org). Students can also receive text messages of cancellations by creating an account on [http://newswires.psu.edu](http://newswires.psu.edu).

### Important Websites

**Electric and Gas Companies**
- Allegheny Power: [http://www.alleghenypower.com](http://www.alleghenypower.com)
- Columbia Gas: [http://www.columbiagaspamd.com](http://www.columbiagaspamd.com)

**Newspapers**
- Centre Daily Times: [http://www.centredaily.com](http://www.centredaily.com)
- The Daily Collegian: [http://www.collegian.psu.edu](http://www.collegian.psu.edu)

**Penn State Website**
- Energy and Mineral Engineering: [http://www.eme.psu.edu](http://www.eme.psu.edu)
- Maps: [http://www.campusmaps.psu.edu/print](http://www.campusmaps.psu.edu/print)
- Meal Plans For Penn State: [http://www.hfs.psu.edu/mealplans/default.shtml](http://www.hfs.psu.edu/mealplans/default.shtml)
- Parking: [http://www.transportation.psu.edu](http://www.transportation.psu.edu)
- Penn State ID Card: [http://www.idcard.psu.edu](http://www.idcard.psu.edu)
- Penn State Main Webpage: [http://www.psu.edu](http://www.psu.edu)
- Programs and Course Description Bulletins: [http://www.psu.edu/ur/prgcoursedes.html](http://www.psu.edu/ur/prgcoursedes.html)
- Student Aid: [http://www.psu.edu/dept/studentaid](http://www.psu.edu/dept/studentaid)
- Tuition Estimates: [http://www.psu.edu/tuition.psu.edu](http://www.psu.edu/tuition.psu.edu)
- Undergraduate Degree Bulletin Blue Book: [http://www.psu.edu/bulletins/bluebook](http://www.psu.edu/bulletins/bluebook)

**Phone Companies**
- AT&T The New Cingular: [http://www.att.com](http://www.att.com)
- Verizon: [http://www.verizon.com](http://www.verizon.com)

**Television**
- Comcast: [http://comcast.com](http://comcast.com)

**Transportation**
- CATA Bus Service: [http://www.catabus.com](http://www.catabus.com)
- GreyHound: [http://www.greyhound.com](http://www.greyhound.com)
- Taxi: [http://www.handydelivery.com](http://www.handydelivery.com)
Step in the right direction... choose EME today and ensure a healthy tomorrow for both society and the environment.