Proposal Form For Addition And Revision Of Courses

1. Proposing College / School: College of Engineering
   Department: College of Engineering (ENGR)

2. Course Prefix and Number: ENGR 2700  3. Effective Term: Fall 2012

4. Course Title: Nuclear Power Operations, Systems & Careers
   Abbreviated Title (30 characters or less): Intro to Nuclear Power Careers

5. Requested Action:
   - [ ] Renumber a Course  Current Course Number: 
   - [ ] Add a Course  Proposed Course Number: 
   - [ ] Revise a Course  Type of Revision: 
     Grading Type

6. Course Credit:
   
<table>
<thead>
<tr>
<th>Contact/Group Hours</th>
<th>Scheduled Type</th>
<th>Weekly or Per Term?</th>
<th>Credit Hours</th>
<th>Anticipated Enrollment</th>
</tr>
</thead>
<tbody>
<tr>
<td>Maximum Hours (Repeatability): 1</td>
<td>1 Lecture</td>
<td>Weekly</td>
<td>1</td>
<td>50</td>
</tr>
</tbody>
</table>

   Total Credit Hours: 1

7. Grading Type:
   - [ ] Regular (ABCDF)  
   - [ ] Satisfactory/Unsatisfactory (S/U)  
   - [ ] Audit

8. Prerequisites/Corequisites:
   Use "P:" to indicate a prerequisite, "C:" to indicate a corequisite, and "P/C:" to indicate a prerequisite with concurrency.
   P/C MATH 1600

9. Restrictions: List specific restriction in space above.
   - [ ] College  
   - [ ] Major  
   - [ ] Standing  
   - [ ] Degree

10. Course Description:
   (20 Words or Less; exactly as it should appear in the Bulletin)
   Overview of nuclear power generation systems including civilian and government career options as an Auburn graduate.

11. May Count Either: N/A or N/A  
    (Indicate if this particular course cannot be counted for credit in addition to another)

12. Affected Program(s):
    (Respond "N/A" if not included in any program; attach memorandum if more space is required)
    
    | Program Type | Program Title | Requirement or Elective? |
    |--------------|---------------|-------------------------|
    | Minor | Nuclear Power Generation Systems | Required |

13. Overlapping or Duplication of Other Units' Offerings:
    (If course is included in any other degree program, is used as an elective frequently by other unit(s), or is in an area similar to that covered by another college/school, attach correspondence with relevant unit)
    - [ ] Applicable  
    - [ ] Not Applicable
14. Justification:

After teaching this course for two semesters, experience has shown that the original ABCDF criteria is neither adequate nor fair in this fast paced and intensive overview course with its many reading assignments, discussion groups and field trips. The course meets the requirements initially intended as the pre-requisite/corequisite course for the other four (4) four-hour ENGR courses in the minor as a S/U graded course. The course introduces the students to the Nuclear Power Generation Systems minor. Current students have earned scholarships, co-op jobs and internships in the nuclear industry. Although unable to complete the minor given its recent program start, seven previous students are now employed in the industry. Five current students are interviewing with industry.

The director and faculty unanimously recommend and desire for this change to occur in order to maintain the highest standards in the fairest way possible.

(Include a concise, yet adequate rationale for the addition/revision of the course, citing accreditation, assessments (faculty, graduate, and/or external) where applicable)

15. Resources:

Industry is donating scholarships, internships, named professorships, and equipment to establish the program at Auburn. Additional Auburn resources are not desired or needed at the current time.

(Indicate whether existing resources such as library materials, classroom/laboratory space, and faculty appointments are adequate to support the proposed addition/revision; if additional resources are required, indicate how such needs will be met, referencing the appropriate level of authorization – i.e.: Dean – where necessary; if no additional resources or shifting of resources will be necessary, respond "Not Applicable")

16. Student Learning Outcomes:

This course introduces nuclear power generation as a multidisciplinary career for engineering graduates from all fields of engineering. Industry leaders (e.g., Tennessee Valley Authority, Southern Nuclear Company, Williams Industrial Group, etc.) partner with the engineering faculty to explain the need for engineers from all disciplines to consider working for the emerging 21st century power distribution industry. The role of nuclear power generation as a baseline cornerstone for energy independence is discussed, along with all the supporting alternative energy sources that will be necessary to handle peak transient loads.

This course supports the following ABET accreditation outcomes:

(e) an ability to identify, formulate, and solve engineering problems
(f) an understanding of professional and ethical responsibility
(h) the broad education necessary to understand the impact of engineering solutions in a global, economic, environmental, and societal context
(i) a recognition of the need for, and an ability to engage in lifelong learning
(j) a knowledge of contemporary issues

The students exit the course with a detailed knowledge of the four mandatory follow-on courses in the minor and an appreciation for the industry’s hard work ethic and demanding standards.

(State in measurable terms (reflective of course level) what students should be able to do when they have completed this course)

17. Course Content Outline:

Following topics are covered over 15 weeks (at a minimum).
(a) Overview of Nuclear Power Generation Systems
(b) The "cost" of electricity
(c) American electrical distribution systems
(d) Nuclear heat generation process (fission)
(e) Radiation Health and Safety issues
(f) Nuclear Reactor types (e.g., PWR, BWR, Liquid Metal Cooled, etc)
(g) Primary Nuclear Systems (pumps, steam generators, etc)
(h) Secondary Nuclear Systems (turbines, condensate systems, efficiencies)
18. Assignments / Projects:

Course content listed above is evenly divided over 15 weeks, supplemented by the following graded requirements.

- 15 homework assignments (10 points each)  
  - Total: 150 Points
- 15 weekly quizzes (10 points each)  
  - Total: 150 Points
- Mandatory attendance at seminars of opportunity  
  - Total: 50 Points
- Mandatory day-long field trip to nuclear plant  
  - Total: 250 Points
- Total Possible Points  
  - Approx. 600 Points

Homework assignments will consist of small literature reviews on topics of current interest in the nuclear industry and the topics of the next week's lecture. Quizzes will be taken for every reading assignment. Seminars by guest speakers may be mandated. Simplified schematics will be a part of each examination. Attendance at the capstone visit near the end of the course is mandatory to pass the course. Unsatisfactory performance of any item requires mandatory retesting until the item is passed as is the norm in the Nuclear Power industry.

(List all quizzes, projects, reports, activities and other components of the course grade — including a brief description of each assignment that clarifies its contribution to the course's learning objectives)

19. Rubric and Grading Scale:

See 18: Using S/U grading, students must achieve the nuclear industry standard of 90% cumulative performance (540 points).

(List all components of the course grade — including attendance and/or participation if relevant — with point totals for each; indicate point totals and ranges or percentages for grading scale; for S/U grading, detail performance expectations for a passing grade)

20. Justification for Graduate Credit:

N/A

(Include a brief statement explaining how the course meets graduate educational standards (i.e.: rigorous standards for evaluation, development of critical thinking and analytical skills, etc.))

(Included below are standard statements regarding course policies. If necessary, a statement may be altered to reflect the academic policies of individual faculty members and/or the academic unit or department, provided that there is no conflict with the Student Policy eHandbook, Faculty Handbook, or any existing university policy.)

POLICY STATEMENTS

Attendance: Although attendance is not required, students are expected to attend all classes, and will be held responsible for any content covered in the event of an absence.
Excused Absences: Students are granted excused absences from class for the following reasons: illness of the student or serious illness of a member of the student’s immediate family, the death of a member of the student’s immediate family, trip for student organizations approved by an academic unit, trip for university classes, trip for participation in intercollegiate athletic events, subpoena for a court appearance, and religious holidays. Students who wish to have an excused absence from class for any other reason must contact the instructor in advance of the absence to request permission. The instructor will weigh the merits of the request and render a decision. When feasible, the student must notify the instructor prior to the occurrence of any excused absences, but in no case shall such notification occur more than one week after the absence. Appropriate documentation for all excused absences is required. Please consult the Student Policy eHandbook for more information on excused absences.

Make-Up Policy: Arrangement to make up a missed major examination (e.g., hour exams, mid-term exams) due to properly authorized excused absences must be initiated by the student within one week of the end of the period of the excused absence(s). Except in unusual circumstances, such as the continued absence of the student or the absence of university holidays, a make-up exam will take place within two weeks of the date that the student initiates arrangements for it. Except in extraordinary circumstances, no make-up exams will be arranged during the last three days before the final exam period begins.

Academic Honesty Policy: All portions of the Auburn University student academic honesty code (Title XII) found in the Student Policy eHandbook will apply to university courses. All academic honesty violations or alleged violations of the SGA Code of Laws will be reported to the Office of the Provost, which will then refer the case to the Academic Honesty Committee.

Disability Accommodations: Students who need accommodations are asked to electronically submit their approved accommodations through AU Access, and to arrange a meeting during office hours the first week of classes, or as soon as possible if accommodations are needed immediately. If you have any conflict with my office hours, an alternate time can be arranged. To set up this meeting, please contact me by e-mail. If you have not established accommodations through the Office of Accessibility, but need accommodations, make an appointment with the Office of Accessibility, 1223 Haley Center, 904-256-1777.