**Nuclear Fuels**  
ENU 6937  Section 17GH  
*Class Periods:* M, W, F, 7, and 1:55pm-2:45pm  
*Location:* WIM1084  
*Academic Term:* Fall 2017

**Instructor:**  
Yong Yang  
yongyang@ufl.edu  
352-846-3791  
Office Hours: Walk-in or appointment by email

**Teaching Assistants:**  
Please contact through the Canvas website  
- N/A

**Course Description**  
Survey of the nuclear fuels from ore to waste, including mining, design, fabrication, in-core performance, storage, disposal and fuel economics.

**Course Pre-Requisites / Co-Requisites**  
None

**Course Objectives**  
To provide the students with an in-depth knowledge of the technical aspects of various stage of the nuclear fuel cycle with an emphasis on materials behavior, structural and thermal analysis.

**Materials and Supply Fees**  
None.

**Required Textbooks and Software**  
None, the course notes will be provided on Canvas.

**Recommended Materials**  
- Fundamental Aspects of Nuclear Fuel Elements  
- Donald R Olander  
- Publication date and edition: Energy Research and Development Administration  

**Course Schedule**  
Week 1: Introduction and overview of fuel performance/ Yong Yang  
Week 2: Fuel Resources, mining, conversion and enrichment  
Week 3: Reactor fuels, fission yields and fuel chemistry  
Week 4: Fuel Claddings  
Week 5: Fuel Assemblies, fuel cladding interactions  
Week 6: Loading, burn-up and refuel  
Week 7: Densification, swelling and creep  
Week 8: Thermal analysis  
Week 9: Fuel failure  
Week 10: LOCA  
Week 11: FRAPCON code for fuel performance evaluation
Week 12: Reprocessing  
Week 13: Water pool and dry storage  
Week 14: Geologic repository disposal  
Week 15: Fuel economics  
Week 16: New fuel concepts, ATF  

**Attendance Policy, Class Expectations, and Make-Up Policy**  
All students are expected to attend class, and Excused absences are consistent with university policies in the undergraduate catalog ([http://gradcatalog.ufl.edu/content.php?catoid=10&navoid=2020#attendance](http://gradcatalog.ufl.edu/content.php?catoid=10&navoid=2020#attendance)) and require appropriate documentation. Cell phones and other electronic devices must be completely silence in class. Activities that are not part of the class are not allowed during class time.

**Evaluation of Grades**

<table>
<thead>
<tr>
<th>Assignment</th>
<th>Total Points</th>
<th>Percentage of Final Grade</th>
</tr>
</thead>
<tbody>
<tr>
<td>Midterm project</td>
<td>100 each</td>
<td>30%</td>
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<tr>
<td>Presentation</td>
<td>100 each</td>
<td>30%</td>
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<tr>
<td>Final paper</td>
<td>100</td>
<td>40%</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>100%</strong></td>
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**Grading Policy**

<table>
<thead>
<tr>
<th>Percent</th>
<th>Grade</th>
<th>Grade Points</th>
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<tbody>
<tr>
<td>90.0 - 100.0</td>
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<tr>
<td>87.0 - 89.9</td>
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<td>3.67</td>
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<tr>
<td>84.0 - 86.9</td>
<td>B+</td>
<td>3.33</td>
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<tr>
<td>78.0 - 80.9</td>
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<tr>
<td>75.0 - 79.9</td>
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<tr>
<td>72.0 – 74.9</td>
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<tr>
<td>69.0 - 71.9</td>
<td>C-</td>
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<tr>
<td>66.0 - 68.9</td>
<td>D+</td>
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<tr>
<td>63.0 - 65.9</td>
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<tr>
<td>0 - 59.9</td>
<td>E</td>
<td>0.00</td>
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</tbody>
</table>

More information on UF grading policy may be found at: [http://gradcatalog.ufl.edu/content.php?catoid=10&navoid=2020#grades](http://gradcatalog.ufl.edu/content.php?catoid=10&navoid=2020#grades)

**Students Requiring Accommodations**

Students with disabilities requesting accommodations should first register with the Disability Resource Center (352-392-8565, [https://www.dso.ufl.edu/drc](https://www.dso.ufl.edu/drc)) by providing appropriate documentation. Once registered, students will receive an accommodation letter which must be presented to the instructor when requesting accommodation. Students with disabilities should follow this procedure as early as possible in the semester.

**Course Evaluation**

Students are expected to provide feedback on the quality of instruction in this course by completing online evaluations at [https://evaluations.ufl.edu/evals](https://evaluations.ufl.edu/evals). Evaluations are typically open during the last two or three weeks of the semester, but students will be given specific times when they are open. Summary results of these assessments are available to students at [https://evaluations.ufl.edu/results/](https://evaluations.ufl.edu/results/).

**University Honesty Policy**

*Nuclear Fuels, ENU, and 6937*  
*Yong Yang and Fall 2016*
UF students are bound by The Honor Pledge which states, “We, the members of the University of Florida community, pledge to hold ourselves and our peers to the highest standards of honor and integrity by abiding by the Honor Code. On all work submitted for credit by students at the University of Florida, the following pledge is either required or implied: “On my honor, I have neither given nor received unauthorized aid in doing this assignment.” The Honor Code (https://www.dso.ufl.edu/sscr/process/student-conduct-honor-code/) specifies a number of behaviors that are in violation of this code and the possible sanctions. Furthermore, you are obligated to report any condition that facilitates academic misconduct to appropriate personnel. If you have any questions or concerns, please consult with the instructor or TAs in this class.

Software Use
All faculty, staff, and students of the University are required and expected to obey the laws and legal agreements governing software use. Failure to do so can lead to monetary damages and/or criminal penalties for the individual violator. Because such violations are also against University policies and rules, disciplinary action will be taken as appropriate. We, the members of the University of Florida community, pledge to uphold ourselves and our peers to the highest standards of honesty and integrity.

Student Privacy
There are federal laws protecting your privacy with regards to grades earned in courses and on individual assignments. For more information, please see: http://registrar.ufl.edu/catalog0910/policies/regulationferpa.html

Campus Resources:

**Health and Wellness**

- **U Matter, We Care:** If you or a friend is in distress, please contact umatter@ufl.edu or 352 392-1575 so that a team member can reach out to the student.

- **Counseling and Wellness Center:** http://www.counseling.ufl.edu/cwc, and 392-1575; and the University Police Department: 392-1111 or 9-1-1 for emergencies.

- **Sexual Assault Recovery Services (SARS)**
Student Health Care Center, 392-1161.

- **University Police Department** at 392-1111 (or 9-1-1 for emergencies), or http://www.police.ufl.edu/.

**Academic Resources**

- **E-learning technical support,** 352-392-4357 (select option 2) or e-mail to Learning-support@ufl.edu.
  https://lss.at.ufl.edu/help.shtml.


- **Library Support,** http://cms.uflib.ufl.edu/ask. Various ways to receive assistance with respect to using the libraries or finding resources.

- **Teaching Center,** Broward Hall, 392-2010 or 392-6420. General study skills and tutoring.
  https://teachingcenter.ufl.edu/.

- **Writing Studio, 302 Tigert Hall,** 846-1138. Help brainstorming, formatting, and writing papers.
  https://writing.ufl.edu/writing-studio/.

- **Student Complaints Campus:** https://www.dso.ufl.edu/documents/UF_Complaints_policy.pdf

- **On-Line Students Complaints:** http://www.distance.ufl.edu/student-complaint-process.