Research Project  
ChE/MSE 6810 – Winter 2012

Instructors:  
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Course Objectives:  
to provide senior undergraduate students in the Molecular and Nanotechnology, and the Biomedical tracks offered in ChE/MSE an opportunity to develop independent research and professional skills, and to motivate them to pursue further education and careers in science and engineering.

Learning Outcomes:  
upon completion of this course, the students will
1. be able to conduct independent research
2. be able to solve complex engineering problems while working as part of a team
3. be able to operate (and understand the basic principles of) one or two state of the art pieces of equipment or computational tools used in advanced Molecular Engineering and Nanotechnology and/or Biomedical research
4. develop professional skills, including technical writing (emphasis), and also oral presentations.

Class Meetings:  
MW 2:30 – 3:20PM - ENG 1118

Office Hours:  
by appointment (e-mail)

Course Web page:  
go to WSU Pipeline. Visit the class website for announcements and materials. Any changes in the syllabus will be posted online. Remember to forward e-mails from your “aaxx@wayne.edu” account to your preferred e-mail address.

Grading system*:  
Monthly progress report  40 POINTS (4x)  
Final presentation:  20 POINTS  
Final report:  30 POINTS  
Proposal:  10 POINTS
* part of the grade will be in consultation with your research advisor. The monthly progress reports will be evaluated by their content and presentation. The outcome of your research project depends on the effort you put every day. Therefore, the monthly progress reports will make up for a large portion of your final grade. They should be a maximum of 2 pages each, excluding references. The idea is to build all parts of a publication, but to a smaller scale. Report #01: Introduction; Report #02: Materials & Methods; Report #03: Results and Discussions; Report #04: Conclusions.

Outline (at a glance):

<table>
<thead>
<tr>
<th>Date</th>
<th>Written Component Due</th>
<th>Professional Component</th>
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<tbody>
<tr>
<td>01/11</td>
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<td>PPT past results</td>
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<tr>
<td>01/18</td>
<td>1 page proposal</td>
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<td>01/25</td>
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<td>Basic elements of a research paper / Sci Finder / EndNote</td>
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<tr>
<td>02/01</td>
<td>“Introduction” due</td>
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<td>02/08</td>
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<td>02/15</td>
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<tr>
<td>02/22</td>
<td>“Materials &amp; Methods” due</td>
<td>PPT of Materials &amp; Methods</td>
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<tr>
<td>02/29</td>
<td>Revised 1 page proposal due</td>
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<td>03/07</td>
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<td>03/14</td>
<td>SPRING BREAK</td>
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<tr>
<td>03/21</td>
<td>Results due</td>
<td>PPT of Results (03.21)</td>
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<td>03/28</td>
<td>Proposal is due</td>
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<td>04/04</td>
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<tr>
<td>04/11</td>
<td>“Results &amp; Discussion” due</td>
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<td>04/18</td>
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<td>PPT – final</td>
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<td>04/25</td>
<td>Final report due</td>
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Outline (detailed):

Week #01
- Present past results (ChE5811 or 5809) – 5 min ppt presentation. Please come prepared with your laptop, pointer and prepared speech.

Week #02
- A one page proposal that describes the work to be accomplished during the semester is due. This proposal needs to be signed by the faculty mentor (could be e-signed; i.e., ask the faculty to e-mail the proposal directly to us after you both have agreed on it).
- Submit (via e-mail) the weekly meeting time agreed between you and your faculty/PhD student mentor or weekly group meeting time with your group. You need to be able to attend those meetings every week.

Week #03
- We will discuss the basic elements of a research paper and methods for literature search - emphasis on SciFinder Scholar. Introduction to EndNote will also be provided.
Week #04
  • Introduction is due. The students will have read a significant number of peer reviewed articles (agree with your mentor which ones are the most relevant) and a two-page write up entitled 'Introduction' will be due. The write up should be in the format (font size, title scheme, margins, etc) of a manuscript to be submitted to journal that your advisor suggested, and contain references using EndNote or other equivalent software - if not EndNote, you should use the one your research advisor uses. The references are not part of the 2 page limit.

Week #05
  • No meeting.

Week #06
  • No meeting.

Week #07
  • A write up entitled ‘Materials and Methods’ is due. This should also follow a journal format (same as in ‘Introduction’). You should describe (5 min ppt presentation) the main (one or two) pieces of equipment to be used in their study and methods. A significant knowledge of the principles governing the analytical techniques to be used should be demonstrated during the presentation.

Week #08
  • Revised one page proposal. At this time, any change of course (this is the nature of experimental research!) would have been identified by you and your mentor. If none, send an e-mail with a cc to your advisor stating no adjustments are required.

Week #09
  • No meeting.

Week #10
  • Spring brake. No meeting.

Week #11
  • The students will discuss their results in a 5 min ppt presentation. A write up on the results is due - 2 page maximum, including figures.

Week #12
  • Prepare a proposal to the "Undergraduate Research and Creative Projects Award" (URCPA). The format can be found at: http://undergradresearch.wayne.edu/award.php.
  • The idea here is for you to write a document containing some preliminary data that you have collected and (most importantly) your input on what aspects of the research you think are relevant to explore further – proposed work, so as to demonstrate how much you understand about your research. This proposal should be approved and signed by your faculty mentor and, if (s)he desires to do so, to submit for the award. We require a copy of the full proposal (as if to be submitted to the URCPA) for the grade.

Week #13
  • No meeting.
Week #14
- Submit a write up entitled ‘Results and Discussions’ 2 pages including figures and tables. This should also follow the journal format (same as ‘Introduction’ and ‘Materials & Methods’).

Week #15
- Present a summary of the work - 15 min ppt presentation (final presentation) – we may go beyond lecture time that day! Please let us know if you have a class conflict ahead of time so we can arrange for an alternate day.

Week #16
- Submit final report. It should contain 10 pages. The page range includes all parts of a manuscript you worked before (make sure you incorporate the suggested comments from your graded reports), including "Abstract" and "Conclusions" – excluding references.

**Other policies:**

- The last day to **drop** any class with a tuition refund is the end of the second week of classes. The last day to withdraw from the class, without a notation of W on the transcript, is the end of the fourth week of classes. All drop/add activity during the first 4 weeks should be done through Pipeline. Between the end of the fourth and fifth weeks, withdrawals require the permission of the instructor and must be submitted on a Drop/Add form to the Registrar’s Office.

- The College of Engineering does not allow **withdrawal** from courses after the **fifth week** of classes, except under exceptional circumstances. Failing of a class is not an acceptable excuse for withdrawal after the fifth week.

- In case of **cheating (e.g. plagiarism)**, the student will be automatically failed. Due process action (expulsion or probation) might also occur through the University Judicial Officer.

- An **incomplete** (grade I) will be given only if the student is presently passing the course, most of the course material has been covered and the student can complete the required material without retaking the course and without requiring extensive faculty supervision. An 'I' grade MUST be made up within one year of assignment of the grade. Note also that the **grade of X** should be assigned if there is no basis on which to provide a grade for the student (i.e., the student never showed up in class).
For general WSU policies please visit http://www.bulletins.wayne.edu/gbk-output/gbk-index.html

For specifics on policies from the College of Engineering please visit the Student Bulletin.

“If you feel that you may need an accommodation based on the impact of a disability, please feel free to contact me privately to discuss your specific needs. Additionally, the Office of Educational Accessibility Services (EAS) coordinates reasonable accommodations for students with documented disabilities. The Office is located in the Student Center Building, Room 583, phone: (313) 577-1851 (Voice) / 577-3365 (TTY).”