

Directed Individual Study
M.D. –ERL Literature Review, ChE 4000 / 7000

PROFESSOR

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Class Hours: Thursday, 3:30 – 4:30, 2nd floor conference room
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<http://www.che.msstate.edu/research/MDERL/>

COURSE PREREQUISITES

- Graduate student in M.D.-ERL
- Interest in electrokinetic and microdevice research
- Junior or senior class standing OR employment in the Medical micro-Device Engineering Research Laboratory (M.D. – ERL)

COURSE OBJECTIVES

The purpose of this literature review course is to promote learning from and critical scrutiny of electrokinetics and microdevice literature alongside your research efforts. The discussion of articles tangentially related to your research will benefit you by increasing the breadth of your knowledge. Your depth of understanding and retention of articles in your own research area will increase as you practice and prepare for leading discussions within the forum. The discussion questions will increase the depth of your knowledge in electrokinetics. In addition, your involvement in discussions will teach you to think critically and will aid in developing your own experiments and skills. More specifically, after completion of the course, you will be able to:

- Critically read current literature in electrokinetics and microdevices.
- Lead a discussion on a research article.
- Demonstrate the ability to adapt techniques from articles into your own lab work.
- Critique techniques and conclusions asserted in the literature.
- Conduct a literature search and obtain articles available on-campus and off-campus.
- Analyze data to determine trends and present this to the group.
- Compile a survey of literature on a subject and organize it for oral presentations and
- Write a research article using your survey of the literature and the articles presented / discussed during the semester.

GUIDELINES FOR DISCUSSIONS

When reading a technical article for the first time, it is best to begin by reading the abstract, followed by the introduction and then skip to the conclusions. Next, it can be beneficial to read the figure captions, study the figures and any tables to become familiar with the experimental setup or the data reported. At this time, return back at the beginning and read through the entire article, taking notes or underlining as is comfortable. Reread paragraphs or sections as necessary, then leave the article

overnight and read it again the following day to prepare discussion notes for Journal Club. Make sure to proof read your notes and it is advised to practice your summary and discussion questions. Each presenter will provide a brief overview of the article, and then lead a discussion about:

1. The research methods
 - a. What was novel about the techniques?
 - b. Was there anything that could have been done better?
 - c. Were all variables properly controlled for?
 - d. Can we adapt anything in our own lab?
2. Theory (if included in the article)
 - a. What fundamental equations did the authors start with?
 - b. Did the assumptions they made make physical sense within their system?
 - c. What are the limitations of the final equations?
3. Experimental / theoretical results provided in the paper
 - a. What trends are shown by the figures?
 - b. What questions are left unanswered?
 - c. Were the author's conclusions consistent with the data?
4. Conclusions
 - a. What is the next logical step for this research to take?
 - b. How would you go about conducting research to answer any unanswered questions?
 - c. How will it benefit the research conducted in M.D. - ERL?
5. Overall
 - a. What was well written, well explained, well communicated in the paper?
 - b. What was poorly written / explained / etc in the paper?

When leading a discussion, the foremost goal is to establish a non-threatening climate that is inviting for everyone in the group to engage in the open discussion. The most common mistake is to talk rapidly and over the heads of everyone else in the group in order to appear knowledgeable. This is not conducive to the learning process because other students do not have the time to comprehend the information and are relegated to observers in a monologue. Please avoid this strategy. You may refer to the following resources, which outline strategies such as de-emphasizing your role in the discussion by asking open-ended questions [Tibbitts]. This invites involvement by the group and enriches the depth of discussion of the article. Resources for further reading are:

- Tibbitts, Felisa, "Tips for Leading Discussions" Human Rights Education Association. <http://www.hrea.org/pubs/tips-discussion.html>. Accessed 16 Jan 2006.
- Suber, Peter, "Giving Presentations and Leading Discussions," Earlham College. <http://www.earlham.edu/~peters/courses/leaddisc.htm> Accessed 16 Jan 2006.
- Davidson, C.I. and S. A. Ambrose, "The New Professor's Handbook," Chptr 3: Conducting Discussions, Anker Publishing Company, Inc. Bolton, MA, 1994.

DAILY GRADES

- The main activity in this course is the critical reading of assigned articles and integral involvement in discussions of them.
- This requires reading the article in advance of the meeting, prompt attendance at all meetings, and active participation in discussions.
- You will be receive a daily grade at each meeting that will be computed as follows:
 - (30%) Prompt attendance
 - (30%) Demonstrate prior knowledge of article (having read it prior to the meeting)
 - (40%) Discussion of topics including asking questions, assessment of content, interpretations, etc.

PRESENTER'S GRADE

- On the days you lead discussions, you will need to prepare an article summary (2 to 3 paragraphs) and an outline of discussion items.
- You will be graded on the following rubric:
 - (30%) Preparation and demonstration of familiarity with the article
 - (30%) Article Summary
 - (40%) Outline and discussion of topics including answering and asking questions, assessment of content, interpretations, etc.
- **Remember, you do not have to be an expert on the article, just a guide.**

ORAL PRESENTATION: COMPILED SURVEY OF THE LITERATURE

One oral presentation (10 – 15 minutes long) will be due midway through the semester.

Graduate Students: This progress report is to include a motivation, background and literature review, premise of your research project, experimental description, results including plots of data, and interpretations / conclusions.

Undergraduate Students: Presentation of 8 to 10 minutes will include summary of literature review and overview of your research.

Research Progress Presentation scheduled for 28 February

FINAL REPORT: COMPILED SURVEY OF THE LITERATURE

Graduate Students: A final report (10 - 15 pages, double spaced) will be due at the end of the semester and will include the same sections as a traditional research article.

Undergraduate Students: A final report (5 - 10 pages, double spaced) will be due at the end of the semester and will include the same sections as a traditional article.

Final Presentations / Reports scheduled for April 24 / May 2

GRADING

Daily Grades: 30%

Presenter's Grade: 25%

Progress Report: 20%

Final Report: 25%

Letter grades will be assigned on the scale:

90 – 100 % A

80 – 90 % B

70 – 80 % C

60 – 70% D

< 60 % F

POLICIES AND PROCEDURES

Absences: In order to accomplish the objectives of this course, your continual participation is needed. You will automatically be granted one excused absence to account for any sicknesses, emergencies, or conflicts that may arise with your normal academic load. However, these absences should be communicated to the instructor 1 day or more in advance of the meetings.

Grade Corrections: Despite my best intentions, my grading can be fallible. If you would like to dispute any grade on participation, progress reports, or your final report, please submit the request in writing within one week. No regrades will be considered after this grace period.

Severance of employment in M.D. ERL: Participation in Journal Club is a requirement of employment in M.D. – ERL. However, participation in Journal Club does not require employment in M.D. ERL. Therefore, any student may elect to remain in this course regardless of employment status.

Honorable Code of Ethics: Everyone should maintain the highest standards of respect for their work and the work of others. Every facet of your actions should demonstrate respect for the learning process, yourself, your classmates, and the instructor. You are encouraged to freely discuss research concepts and projects amongst one another in order to formulate your individual reports. In all cases, the written work you turn in should represent your understanding of the material. ***All occurrences of academic misconduct will be dealt with in accordance with guidelines and procedures outlined in MSU's new Honor Code.***

Mississippi State University has an approved Honor Code that applies to all students. The code is as follows:

"As a Mississippi State University student I will conduct myself with honor and integrity at all times. I will not lie, cheat, or steal, nor will I accept the actions of those who do."

Upon accepting admission to Mississippi State University, a student immediately assumes a commitment to uphold the Honor Code, to accept responsibility for learning, and to follow the philosophy and rules of the Honor Code. Students will be required to state their commitment on examinations, research papers, and other academic work. Ignorance of the rules does not exclude any member of the MSU community from the requirements or the processes of the Honor Code. For additional information please visit: <http://www.msstate.edu/dept/audit/PDF/1207.pdf>.

If you have questions about any statements outlined here, please do not hesitate to come speak to me.

TENTATIVE SEMESTER SCHEDULE (Please see periodic updates on website)

10 Jan.:

17 Jan.: Literature search due – come with 4 possible articles, Biosafety training

24 Jan.: Soumya Keshavamurthy

31 Jan.: Kaela Leonard

7 Feb.: Aytug Gencoglu

14 Feb.: Emily Cotten

21 Feb.: Anell Pullen

28 Feb.: Oral Presentations

6 Mar.: No Journal Club – AM will be gone to give a seminar

13 Mar.: Spring Break

20 Mar.: Soumya Keshavamurthy

27 Mar.: Kaela Leonard

3 Apr.: Aytug Gencoglu

10 Apr.: Emily Cotten

17 Apr.: Anell Pullen

24 Apr.: Final Reports Due