CHEM 534 / CHEM 634 Evaluation Scheme

Nanoscience & Nanotechnology / Advanced Materials

25% Test 1 Feb 12, 4:00-5:30pm BURN 1B39
25% Test 2 end of March
20% Refereeing a paper (due 5 March)

Undergraduates:
30% writing a review article (9 Apr)
Graduates:
30% research proposal (written part – 9 Apr)
(oral presentation ~13 Apr?)

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TESTS 1 & 2 (2 x 25%)

Written, closed-book tests will each consist of ~20 multiple choice questions covering two parts of the course:

TEST 1 - first five lectures by Lennox, Kambhampati, Eisenberg

TEST 2 - all other lectures

Providing a proper background knowledge exists, paying attention on the lectures will generally suffice to succeed in the test.

Refereeing a Paper (20%)

Write a critical review of a *published* scientific paper (chose one among the provided). The style of the review should resemble a referee report in peer-reviewed journals (examples will be provided on WebCT).

The review should fit on **one page** (letter size paper, margins of no smaller than 1.9 cm, font no smaller than Times New Roman 12 pt).

The evaluation will be based on your grasp of the important points and the power of criticism. An ideal review will demonstrate your understanding of the subject, and will highlight both strong and weak points of a paper, **and suggest** pathways for improvements. Avoid overemphasizing minor deficiencies; e.g., comments on poor English grammar of the authors will not earn you many points.

Review Article (30%)

(undergraduate students only)

Prepare a literature review in a broadly defined area of adbanced materials and nanoscience. This should summarize important recent developments on some focused topic (ca. 10-15 papers), be written in a style of a scientific paper, and include Title, Abstract (<0.5 page), Introduction, sub-sections, Conclusions and References.
Maximum length (including figures) is 7 pages, single spacing, font no smaller than Times New Roman 12 pt.

You are encouraged to look at the published short reviews/feature articles/mini-reviews/highlights in leading journals in the field (Angew. Chemie; Adv. Materials, Small, Adv. Funct. Mater., J. Mater. Chem., Chem. Mater.)

The grading will be based on clarity of presentation, grasp of the subject and significance of the reviewed papers for the field.

Research Proposal (30%)

(graduate students; can be chosen by undergraduates, subject to approval)

Write an original proposal for scientific investigation related to advanced / nano materials, not directly relevant to your current or past thesis research.

The proposal should consist of clearly marked five parts: *Introduction* (describing the importance of the problem), *Literature context* (describing important previous achievements in the area, on which you build up your proposal), *Objectives* (which would clearly and concisely describe the goals of this research), *Methods and Approaches* (this is the place to tell how exactly are you going to achieve your goals, both conceptually – how and why this approach should work, and technically – what instrumental methods, control experiments, etc. are to be executed) and *Potential Benefits* (here you should re-capitalize what important new knowledge / material / technology you will develop, and what will be broader implications for the field). It is advisable to use graphics, charts etc. to better communicate your ideas.

The quality of the proposal will be judged by (1) scientific originality and importance of a problem, (2) clarity of the text, (3) resourcefulness/awareness of the literature, (4) clarity of your oral presentation and your answers to the questions.

The proposal should not exceed five pages (single space) **plus** references (these should be linked to the statements in the text; the citations must include titles of the papers).

Research Proposal (30%)

(graduate students; can be chosen by undergraduates, subject to approval)

You might want to use an ”algorithm” below in preparing your proposal:

1) select a field outside of your current/past research area, which is nevertheless of genuine interest for you, and in which you could apply at least some of your experimental knowledge;
2) read recent reviews and/or important original papers to get an idea of the field challenges and opportunities of the field (a tip: it is helpful to identify the authors who are the authorities in the field and try to follow their papers);
3) identify a problem/question which seems important but which as not yet addressed;
4) plan a sequence of experiments which collectively can address this problem/question;
5) search for appropriate literature to support the feasibility of your approach (or reject some unrealistic ideas);
6) start writing early, let your ideas to “mature” and improve upon your original writing before submitting.

You might also find useful to read the article “Arts of Grantsmanship” by Prof. Kraicer (will be posted on WebCT; use with your own judgment as not all comments/advices will apply to you)