

Chem 282 -- Undergraduate Seminar

Spring 2015 -- Prof. Willem Leenstra

Introduction

The ability to communicate science in a clear and easily understandable way is a critical skill. Over the past few years you have had ample opportunity to practice the art of writing scientific reports. While clear writing is a prerequisite for a successful career in science, the ability to deliver a high quality oral presentation is just as important. The purpose of the seminar course is to help you develop good oral presentation skills.

First and foremost, the goal of a seminar should be to teach the audience something. This is an important point since many students mistakenly think that faculty “already know it all” and thus gloss over important background material. Keep in mind that you will be presenting to not only faculty (who, by the way, do not know it all – although generally well versed in our disciplines, we know little to nothing about many other fields of chemistry), but also fellow graduate students and undergraduates. As such, your presentation should be well balanced and you should not assume too much prior knowledge from the audience.

Choosing a Topic

Most importantly, the topic you choose needs to be relevant to CHEMISTRY! Remember, chemists consider things on the atomic and molecular level. Avoid seminars that focus on applications of chemistry in other fields, but which don't thoroughly discuss the topic from a chemistry standpoint. For example, a survey of drugs recently approved by the FDA would be a poor topic. On the other hand, an in-depth discussion about the chemical basis of a disease state and how specific drugs interact with the biological system to have therapeutic effect would probably be well received. Overall, the guidelines for your choice of topic include the following:

- (1) Your topic should be of interest, and relevant, to chemistry primarily.
- (2) It must not overlap with the undergraduate research you may be involved with.
- (3) It must lend itself to a non-superficial, in-depth treatment.
- (4) But at the same time the topic must be broad enough to put it in perspective with related areas.
- (5) The seminar should predominantly be taken from the current periodical literature, it should not be an account from a review paper or from text books (nor the internet).
- (6) Your topic should be chosen by you within the first few weeks of the semester (see Schedule). This is done in conjunction with me and your research advisor (or other appropriate faculty member, but the final title is your responsibility).

For current topics of interest you might want to consult Chemical & Engineering News (the non-research, professional magazine of the ACS) which reports on developing areas, or the journals Chemical Reviews, or Accounts of Chemical Research, both of which publish summaries of topics in specific areas. When using the latter two media, you have to be careful; keep in mind point (5) above, which means that you would have to expand significantly on what's presented in the review. However, using a somewhat older review article as a starting point to gather background material that you then build off of with more current research would be acceptable. Also, you can use a review article as a springboard to explore a related subject not covered by the article. Beware, faculty are pretty savvy at sniffing out a presentation that has relied mostly on one review article.

I will make available a reference sheet with searching techniques.

Written Paper

The talk's accompanying paper (the "synopsis") should essentially be a summary of the talk. For Chem 282, you should aim to have the text be 5-10 double-spaced pages when combined with pertinent figures and a reference section. The referencing in this synopsis should correspond to the format found typically in American Chemical Society (ACS) journals [please take a look in any of the ACS journals and review the correct way of citing references]. In addition to this summary, a two-hundred to three-hundred word abstract, such as what one would find for a journal article, should be included as a preface to the synopsis, on the title page (which has your name and the presentation's title on it). The title page and abstract will be emailed to the department prior to your presentation. Techniques for searching the literature may be discussed with the reference librarian, your research associates, or me.

Since part of your grade is based on the written component, a significant effort should be expended to ensure that your synopsis is of reasonable quality. In particular, the writing style should be clear and grammatically correct. Figures should be produced with appropriate software, and structures must be drawn with one of the chemical drawing programs. It is recommended that you have someone (in addition to yourself) proof the text. Your synopsis should be given to me on time (see schedule below), so that I can make some final suggestions as you prepare for your practice runs. I will also be available to help edit your first draft. The paper should be composed neatly; a copy must be mailed to each faculty member as well as your fellow Chem 381 students, by the due date.

PowerPoint Presentation

Your PowerPoint presentations can be accommodated by the resident desktop computer. You are to load your presentation onto the computer before 11:30, preferably you will have taken care of this before the first class meets in Angell B-112 that morning, i.e., before 8:30 AM. It is absolutely necessary for you to go through a test to insure that your PPT is compatible with the room's machine. The reason for all this is to have a smooth transition between presentations, which should take no more than one minute.

The slides are meant to clarify the material that you are presenting. However, there are also some potential problems that may actually hinder your objectives, so the following points should be considered when preparing overhead slides. As with figures in your abstract, some care should be exercised in preparing PowerPoint slides.

The following guidelines should be kept in mind:

- (1) Avoid overloading a slide with information and avoid extensive amounts of written material on the slide - i.e., present only one major concept per slide. Remember that if a particular item (structure, reaction, instrument design, equation, etc.) is repeatedly referred to, a copy of that slide can simply be inserted at several points in your chain of slides.
- (2) Don't overuse the "bullet" slide. There are more interesting ways to present information.
- (3) Do not photocopy tables from the literature - redo them. Whenever possible, present results in the form of a graph rather than as a list to table of numbers. If you need to present some numbers, pick out the really important values only, but make sure it is clear to the audience what they refer to.
- (4) Choose a font size that will be clearly visible from the back of the seminar room. After making a few slides, load them on the computer in the room to confirm that they look reasonable. Illegible slides are the first thing people will notice and form an easy target on which to criticize your presentation.
- (5) If you use a figure, graph, table, etc. copied-and-pasted directly from a journal, you should have a reference to that article at the bottom of the slide. Lack of such constitutes plagiarism. Even if you don't copy exactly, but represent results or ideas it is expected that you give credit to the investigator who produced the information you're passing on. On the other hand, don't feel obligated to have a reference on each slide; a lot of chemistry is "general knowledge".

Length of the Seminar

Because we have a large number of undergraduate seminars this year (10), and the faculty's preference to not have more than 4 Chem 282 sessions, we will have 2-3 presentations per meeting. There is a class at 1:00 in B-112, so we must be out a minute or so before. With these constraints, then, we are limited to a talk of exactly 25 minutes! We will allot 5 minutes for questions, making the entire presentation 30 minutes long. Going over your allotted time will impact the student(s) who follow you, so I will have to be ruthless in enforcing the 25-minute limit!

The Presentation Itself

In order to be effective, a seminar should be well organized. While it is true that the nature of the organization is somewhat dictated by the nature of the topic, a few suggestions can be made. For example, an introduction should indicate what you plan to cover and why. It should include an outline of the general approach and indicate the significance, if any, of the topic to other areas of chemistry (or related disciplines). It is particularly important to give the non-specialist a clear idea of what the topic is about and what you will be teaching them with your presentation. A proper ending is a very important part of any talk. Depending on the nature of the topic, a short summary, your own thoughts on the subject, and/or a short outline of future work to resolve remaining questions may be appropriate. In addition to presenting a thorough coverage of the topic, you should maintain a critical attitude, i.e., you should not just report what you have read, but you should also strive to inject your own ideas and evaluation of the subject matter.

Delivering an effective seminar presentation is a practiced art. Here are some suggestions that will guide you in the right direction and maximize the impact of your material:

- (1) You should almost always be speaking to your audience, not to the screen where the slide is projected. Focus on maintaining eye-to-eye contact with your audience, and do so from the front – don't talk from the steps on the side of the room.
- (2) When referring to a slide, use the laser pointer to clearly indicate the section of interest on the projected slide. Do not just swirl it around on the projected slide. This is distracting!
- (3) Do not change the slides too quickly; if the slides are put up and taken away rapidly, your audience will never have a chance to absorb the material. You should know that 90% (at least) of your audience has considerably less familiarity with the topic than you do. However, if you go through a slide much slower than the audience's ability to understand it, you will bore the audience. Practice until you strike the correct balance.
- (4) If you are very nervous and have trouble facing an audience, pick two points in the rear of the room and focus on one and occasionally move to the other. Usually the nervousness vanishes once you get into your presentation.
- (5) Speak clearly and not too fast. The latter is often a manifestation of nervousness. Slow down by rephrasing a point several ways, thus taking more time to get the point across.
- (6) Avoid using informal language. For example, when referring to a particular group of workers, do not say "they have shown" etc., but rather specify the person(s) in question, e.g., "Schmedly and co-workers have shown". Alternatively (but not always preferably) use the passive voice, i.e., "it has been shown that ...". Another no-no: "and then use your spectrometer to ...". In other words, use professional language.
- (7) Don't assume audience familiarity with the specialized lingo. It is not a good idea to use common abbreviations for reagents, non-routine instruments, techniques, or equations, etc. (e.g., PAH, ESCA) without first giving the full name at least once. Also avoid excessive use of "name" reactions unless the specific process in question is defined first.
- (8) Practice, practice, practice. Rehearse your talk **out loud** at least four times beginning to end before you present in front of the audience.

- (9) Go through your slides one by one and decide what important point you are trying to get across on that slide. Each slide should only convey one (maybe two) key points.
- (10) Decide in advance what you want to call specific compounds. Saying "... and then they reacted this thing with that ..." is unprofessional. Instead pick out one or two specific functional groups within the molecule (preferably the one undergoing reaction) and call the compound by that name. For example "... the beta amino aldehyde was then reacted with a methyl Grignard reagent to give the secondary alcohol".

Practicing Your Talk

Around two weeks before your seminar, you should be ready to do full practice runs in front of an audience. By this point you should have already gone over the seminar on your own several times. You should try to arrange practice sessions with your classmates to get constructive comments from them (you can return the favor for their seminar). If you are associated with a research group, your research advisor and the folks in the lab are probably more than willing to listen and critique. Usually, there are many points which have to be fixed up after your first live performance - don't get discouraged.

The importance of giving many practice talks well before your actual seminar date cannot be overemphasized.

Questions

You will most likely be asked a few questions after your talk. You should view the questions as a compliment: the person asking was interested enough to want more information. It is also a chance to clarify any points which may have not been presented clearly. Only rarely is the questioner checking up on your knowledge.

Your response to questions should be thoughtful and honest. There are two extremes to be avoided. If there is a question for which you don't have a prepared answer, don't panic and say you don't know. On the other hand, feeling that an answer should always be given, the speaker may ramble on and give an answer which is unrelated to the question. Instead, when a question is asked, make sure you know what the person is asking you; think about it for a few seconds if necessary. Don't be afraid to speculate, but indicate that this is the case if you are doing so. If you are totally lost, don't be afraid to admit you don't know. None of us knows everything!

Evaluation

The chemistry faculty will discuss your presentation, using a categorized, standard form. Each faculty member will also assign a letter grade to your overall performance. The faculty will judge the presentation according to, roughly, the following scheme:

- (1) Written Paper (organization, clarity, use of language) - 20%
- (2) Content (depth of knowledge and scope) - 40%
- (3) Presentation (slides, organization, continuity, speaking style, etc.) - 40%

At the end of the semester you need to make an appointment with me to discuss your seminar performance. I will supply you with a written summary of the faculty's comments and resulting grade. The summary will include constructive criticism as well as highlight areas in which improvements can be made. The final grade is calculated by averaging the grades given by each of the faculty members present at your seminar.

2015 Schedule

- Tuesday, January 20: First meeting as a group to go over the syllabus. Between now and the next meeting, continue looking for topics to base a seminar on. Keep me informed re topic choice.
- Tuesday, February 3: Two weeks later. The second meeting as a group. We'll review your initial choice(s) of a topic (be thinking of a backup), and we'll discuss whether you might have an appropriate topic.
- Remainder of February: Give me an update after you have chosen your final topic. Also, you must meet with a faculty member closest to the area you have selected, and that person must sign off on your choice as well. Copy me on the email you send that faculty person, thanking him/her for the assistance.
- You will do more extensive, focused reading of the literature on your subject. You should stop by informally to give me updates as you make progress: a final outline, sources identified, etc.
- Monday, February 23: Three weeks later. Deadline: I want a final, thorough outline of your talk, with ideas for slides to accompany the ideas, turned in to me. The next four weeks is when you should work very hard, putting the talk together. Go through several drafts.
- Monday, March 23: Four weeks later. Deadline: by now you should have the penultimate draft of your paper done and some of your slides created. Turn your draft and slides in to me.
- Monday, April 13: Three weeks later. Deadline: Final draft of your paper in to me. Submit next draft of slides to me for review.
- Friday, April 17: Deadline: Papers are due into faculty e-mailboxes, and final set of slides shared with me.
- Thursday, April 23: First two seminar presentations
- Tuesday, April 28: Next two seminar presentations
- Thursday, April 30: Next three seminar presentations
- Wednesday, May 6: Last three seminar presentations

Deadlines: Failure to meet a deadline may negatively affect your performance by taking away from your practice time, so keep on track.