Senior Capstone Seminar: Chemical Senses: the biology of smell and taste

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Chemical senses: the biology of smell and taste
Meetings: W 3-4:50 107 Albers
F 3:00-3:50 107 Albers

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Phone: 745-2054       Office hours: TBA
Email: raya6@xavier.edu

The formal description
This course is restricted to senior majors in biology, natural science, or environmental science, and fulfills the "senior capstone" requirement for graduation. A capstone is a culminating course, at the end of which you demonstrate mastery of the concepts that you have learned during the entirety of your education. You will practice and employ common forms of oral and written scientific communication to share your findings with others.

Biology 496 is currently an experimental course to determine whether and how our students can be mentored in larger research groups through the development of original, meaningful literature-based research projects. It will substitute for the traditional senior research experience (BIOL 498-499) and includes similar components.

The less formal description
My vision for this course is inspired by a question: If you started in a field requiring you to become familiar with original research (a subject, a project, a pedagogy, a product, a treatment), what would you do? In other words, what would you do to become an expert in something?

The two things you might be expected to do almost immediately are 1) read all of the literature on some topic, and 2) participate in a “journal club.” Fortunately for us, #2 contributes to success in #1, and we will divide time in this class between these two activities. In general, Wednesdays will be research and writing days, and Friday will be “journal club” days.

Fair warning
This course will require a large investment of time outside class. This is not a lecture class and there is very little content; this is more like a workshop. If you don’t bring your tools (your prepared brain) and materials (assignments) to the workshop, you will not be able to make the best products. You will need to read and to prepare. You will not be able to achieve the learning goals if you take the crisis/panic approach to the course/projects, and your grade will suffer as a result. Please plan accordingly.

Please know that I will be putting a lot of work into this class as well—grading, listening to practice talks, revising, etc. You may stop by my office any time—certainly during scheduled office hours, but also any time my door is open, and by appointment. We are in this together!

Required materials

Additional readings will be posted online. I will expect that you can access Canvas, open electronic files, including Microsoft Office and PDF. Articles posted online will be used under Fair Use provisions of U.S. copyright law.

Online Resources
I will use Canvas for this course. When needed, I will post PowerPoints and other notes on Canvas. All students should be advised that any PowerPoints are DRAFTS and are subject to change. I will also create a Facebook page
for the group where I will post announcements, and I encourage you to join. It is a Xavier group and you will need to have a xavier.edu email associated with your account to join.

**Expectations**
I expect you to conduct yourself as senior science students who will be entering professional life next year. I expect you to manage your time effectively to complete all assignments on time. I expect you to draw on your life experiences and the breadth of your education at Xavier to inform your work. I expect you to give this class the attention it deserves as a capstone course. I expect you to respect my time and the time of your peers. I expect you to attend class.

**Academic Honesty**
Don’t cheat. Demonstrate integrity. Cheating hurts other students and harms the reputation of the university. Cheating is insulting to me. Plagiarism includes copying sentences or phrases from any print or internet source, copying from others, using crib sheets, writing answers for quizzes on your hand, etc. The penalty for academic dishonesty in this course is 0 points on the assignment or a failing grade in the course (depending on the severity/nature of the offense). Per university policy, academic dishonesty will be reported to the dean’s office. It is your responsibility to educate yourself about what constitutes academic dishonesty.

The papers/presentations for this course may build on, but cannot be identical to, any paper/presentation that you have completed for other classes. This constitutes academic dishonesty. If I find that you submitted previously graded work, you will receive a failing grade for that assignment and may receive a failing grade for the course. If you completed a paper on an olfactory topic for entomology last semester, you may use your previous assignment as the basis for your research project, but you cannot turn in identical work.

**Grading**
**Universal Grading Policy**
Senior research (BIOL 496-499) is designed around the assumption that students who complete all requirements will earn a grade of C (satisfactory). In order to earn a B (good), students must show high quality effort, participation, oral and written work. The grade of A (excellent) is reserved for students who demonstrate outstanding ability and effort in all these areas. Students who fail to complete any item to the instructor’s satisfaction will receive a grade of D (enough to graduate). Students who fail to complete multiple items, show poor effort and/or attendance, and/or cannot adequately meet the objectives listed in this syllabus will receive a grade of F. Any student not completing a thesis or presentation will receive grade of F.

Your grade will be calculated based on participation/attendance, your scores on assignments, a semester-long paper, and oral presentations to peers and to the department.

**Grades (Weighted Scores—to calculate, multiply total points by percentage)**
Peer presentations (department-wide): 5%
Peer presentations (within cohort): 5%
Oral presentation: 25%
Assignments (including outlines of scientific papers): 15%
Written thesis: 30%
Drafts: 5%
Works cited page: 5%
Attendance: 10%
Participation (judged by peers, me): Force Multiplier—can add or subtract up to 50% of your grade
Grading Scale
A = 93% and above
A- = 90-92.9%
B+ = 88-89.9%
B = 84-87.9%
B- = 80-83.9%
C+ = 77-79.9%
C = 73-76.9%
C- = 70-72.9%
D+ = 67-69.9%
D = 63-66.9%
D- = 60-63.9%
F = 59.9 % and below

Peer presentations: Throughout the course, students will practice talking about their work by presenting to peers on a rotating basis. For the in-class (within cohort) presentations, names will be drawn out of a hat for presentation order; you must be ready to present any day presentations are assigned. If you are not prepared, you will receive a 50% deduction in points for that presentation. There will also be one or two peer presentation to students and faculty outside of our class. All peer presentations must:

• Be organized
• “Hook” the audience’s interest
• Give background information, with reference to published scientific literature on the topic (describe past studies methodologies and their findings)
• Identify your argument/central thesis and the rationale for it
• Demonstrate evidence of advance preparation and general knowledge (asking and answering questions)
• In later presentations, especially in the spring semester, you will be expected to share results in progress and preliminary conclusions.
• Use at least one visual aid (on paper or chalkboard). This visual aid should be made by the individual presenting student, and should include only minimal text. You need not make handouts for other students unless you believe it would be beneficial; for the department peer-presentations, handouts will be given to the faculty facilitator and returned to your faculty advisor with his/her evaluation of your talk.
• This presentation should not entail you reading notes off a handout or card. Like your teachers in class, you should be prepared to speak without any notes beyond a few points on an outline. Reading from your notes indicates you don’t understand your topic well enough to discuss it.

Oral presentations: Near the end of the spring semester, each student is expected to formally present their work to a larger audience (usually another class). This presentation should include all of the elements from your peer presentations, but incorporated into a formal PowerPoint slide show. We will cover the making of good PowerPoints in class, and you may also refer to your book for tips. PowerPoint shows should include the following elements:

• Good organization, with minimal distracting “effects”
• Graphs with real data
• Visually appealing and clear
• Bulleted text only: again, you should not have to read from your slides.

Assignments: Assignments will take several forms, but may include outlines of articles for Friday journal discussions, sentence exercises, edits of writing samples, and time logs.
Written thesis: The end of the semester culminates in an individually written senior thesis that describes your work in the format of a scientific review paper (our class will cover this format). Draft sections will be due throughout the second half of the semester and redistributed to peers for peer editing. Good-faith efforts on drafts and peer-edits will receive full credit. More details about the written thesis will follow.

Attendance and participation
Attendance is required at every class meeting. Absences due to university-approved events must be arranged with me at least 24 hours in advance. You are allowed 2 unexcused absences without penalty (use these wisely). After these absences, you will lose attendance points. During some classes, attendance will be recorded via short quizzes/writings/group activities. If you are late to class and miss the activity, you will be counted absent for the day. This is for logistical reasons rather than anything to do with my ego—the 15 other people in class do not want to wait for you to arrive before we begin our activities for the day. There are no makeup attendance activities.

Homework is still due whether you come to class or not, and may be put into my mailbox (in the department office) or emailed to me by 5 pm on the day of class. Late work will not be accepted without an acceptable excuse (e.g. from the associate dean, or a physician).

Participation grades are solely at my discretion, although I reserve the right to seek the input of your peers. Aspects that I will consider in determining participation grades include (but are not limited to) enthusiasm, paying attention, answering and asking questions in class, keeping deadlines, good faith effort in activities, being a good citizen, minimizing amount of extra work you make for me, maintaining a positive attitude, and engaging with the material and with peers.

Learning outcomes
When students complete this course, they should be able to:

1. Articulate the differences between colloquial and formal language (written and spoken English), and between literary writing and scientific writing
2. Articulate the goals of all scientific writing
3. Identify errors and suggest corrections to improve clarity of sentences and research articles
4. Conduct a literature search
5. Read a scientific paper in an efficient manner, come to conclusions from the results presented in the paper, and contrast those conclusions with those presented by the author(s)
6. Participate in group discussions of scholarly work
7. Correctly cite a variety of primary and secondary sources in the text and literature cited, and complete an appropriate Works Cited/References page.
8. Incorporate knowledge gained by achieving the previous goals to write an original, comprehensive review article on a topic related to gustation or olfaction in animals
9. Design attractive, discipline/audience appropriate slides for oral presentations using PowerPoint (or analogous software), including appropriate:
   a. Text
   b. Photos (with credit to photographer)
   c. Tables and graphs (if applicable)
10. Create and memorize an informative, audience appropriate script for an oral presentation.
11. Deliver an oral presentation to a group of peers and faculty:
   a. That demonstrates success in achieving the aforementioned goals
   b. With appropriate manner and volume of speech
   c. With physical appearance that is professional and mannerisms that convey confidence
   d. That conforms to an allotted period of time
12. Demonstrate maturity through effective time management, independent and interactive work, and initiative

BIOL 496: Senior Capstone
Spring 2014
### Schedule

The schedule and procedures in this course are subject to change.

<table>
<thead>
<tr>
<th>Week</th>
<th>Date</th>
<th>Topic</th>
<th>Before class:</th>
<th>Assignment/s due:</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>1/15</td>
<td>Introduction, the process of science,</td>
<td>Read Chp. 10 in Hofmann &amp; excerpt from “Your Inner Fish”</td>
<td>One sentence description of research project; bring writing sample (Vert. Phys. or other paper from biology class).</td>
</tr>
<tr>
<td></td>
<td>1/17</td>
<td>Journal club</td>
<td>Ray et al. 2012</td>
<td>Summary of the article due; you will be graded on accuracy. See Hofmann Chp. 9 for format</td>
</tr>
<tr>
<td>2</td>
<td>1/22</td>
<td>Resume writing workshop with Beth Zink.</td>
<td></td>
<td>1 page project proposal due</td>
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<tr>
<td></td>
<td>1/24</td>
<td>Journal club</td>
<td>Axel and Buck 1991</td>
<td>Be prepared for a reading quiz on the article</td>
</tr>
<tr>
<td>3</td>
<td>1/29</td>
<td>Collecting materials for your paper:</td>
<td>Chp. 2 (if needed) &amp; 9 in Hofmann</td>
<td>Resume due</td>
</tr>
<tr>
<td></td>
<td>1/31</td>
<td>Journal club</td>
<td>TBA</td>
<td>Summary/quiz</td>
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<tr>
<td>4</td>
<td>2/5</td>
<td>The art of scientific writing: precise</td>
<td>Chp. 1 &amp; 3 in Hofmann</td>
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<td></td>
<td>2/7</td>
<td>Cohort presentations: 5 min each</td>
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<td>Every student needs to be prepared to present (names will be chosen at random)</td>
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<tr>
<td>5</td>
<td>2/12</td>
<td>Group sentence quiz. Discuss sentence</td>
<td>Chp. 4 in Hofmann</td>
<td>1) One page of your writing sample revised following rules in Hofmann (focus on sentence/word choice). 2) Sentence exercises from last week due.</td>
</tr>
<tr>
<td></td>
<td>2/14</td>
<td>Journal club</td>
<td>TBA</td>
<td></td>
</tr>
<tr>
<td>6</td>
<td>2/19</td>
<td>3-4 pm: Departmental peer presentations</td>
<td>TBA</td>
<td>1) Visual aid for dept. peer presentation due. 2) One page of your writing sample revised following rules in Hofmann (focus on organization).</td>
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<tr>
<td></td>
<td>2/21</td>
<td>Journal club</td>
<td>TBA</td>
<td>1) Summary/quiz. 2) Article outline with at least one correctly formatted reference.</td>
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<tr>
<td>Date</td>
<td>Notes</td>
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<tr>
<td>2/28</td>
<td>Class canceled in honor of Spring Break—HOWEVER, assignment due →</td>
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<tr>
<td>3/3-3/7</td>
<td>SPRING BREAK</td>
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<tr>
<td>3/12</td>
<td>TBA: In-class, small group conferences with Dr. Ray (counts as cohort presentation, so be ready to discuss the status of your project). Video module on citing references in ESA style. Posted in Canvas. REFERENCE CHECK: Turn in FIVE correctly formatted references</td>
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<tr>
<td>3/14</td>
<td>Journal club TBA Summary/quiz</td>
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<tr>
<td>3/19</td>
<td>Peer reviews and writing workshop/independent work. Conferences with Dr. Ray. Bring your laptop, writing materials. A draft of your paper. NO CREDIT if you don’t bring an actual draft. Outlines are not drafts.</td>
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<td>3/21</td>
<td>Journal club TBA Summary/quiz</td>
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<td>3/26</td>
<td>Designing PowerPoints that don’t make your audience’s eyes bleed. Chp. 12 in Hofmann. PowerPoint tutorial on Canvas. Additional reading</td>
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<td>3/28</td>
<td>Journal club TBA Summary/quiz</td>
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<td>3/28 FRIDAY</td>
<td>THESIS DUE at 5 pm THESIS DUE Submit to Turnitin.com by 7 pm.</td>
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<tr>
<td>4/2</td>
<td>Presentation skills: preparation, poise, punctuality; work on presentations in class</td>
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<tr>
<td>4/4</td>
<td>Journal club TBA 1) Title slide and two other slides of your choice due (PDF/printout)</td>
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<td>4/9</td>
<td>In class presentations (memorized)</td>
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<tr>
<td>4/11</td>
<td>Journal club TBA Summary/quiz</td>
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<tr>
<td>4/16</td>
<td>In class presentations (memorized) 1. PDF of presentation 2. Time log</td>
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<td>4/18</td>
<td>EASTER BREAK</td>
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<tr>
<td>4/22-30</td>
<td>FINAL ORAL PRESENTATIONS TO DEPARTMENT!</td>
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<td>4/23</td>
<td>Extra help sections (no formal class this week)</td>
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<td></td>
<td>TBA</td>
<td>Summary/quiz</td>
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<tr>
<td>4/25</td>
<td>Journal club</td>
<td>TBA</td>
<td>Summary/quiz</td>
<td></td>
</tr>
<tr>
<td>15</td>
<td>4/30</td>
<td>Evals, discussion, course wrap up</td>
<td>EVERYTHING IS DUE THAT IS NOT TURNED IN!!!!!</td>
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<tr>
<td>5/2</td>
<td>Last day of class</td>
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<tr>
<td>16</td>
<td>TBA—I don’t think we have to have a final in the capstone course.</td>
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</table>