CHEM 112 PO: Analysis of Scientific Literature – Demystifying the Approach and the Science

Instructor
Prof. Jane M. Liu (SN-216)
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Class
TR 9:35-10:50 am
Prerequisite: CHEM110A PO

Office Hours
Mondays 8-10 am; or by appointment.

A Message From Prof. Liu:

Here are some random facts about myself: I was born and raised in San Diego and I went to Swarthmore for college. I entered college thinking I was a biology major and pre-med. I left college as a biochemistry major off to get my Ph.D. in organic chemistry. Getting my Ph.D. was really *really* hard. But when I look back, I know that experience got me to where I am now. I love my job. I love running a research lab (ask me about it!). I love teaching chemistry to undergraduates. Welcome to my class! I am so excited to be working with you this semester. This is a very special course for me. It is a chance for us to hang out and chat about some cool literature and to take some time to really think about what it means to "be a scientist" and "do science". I have found this course to be liberating, enlightening, and *fun*. I hope that you'll find it special too!

Course Goals

The C.R.E.A.T.E. (consider, read, elucidate hypotheses, analyze and interpret the data, and think of the next experiment) approach to reading scientific literature will be used to teach science content, to expose students to the progression of science research, to demystify the process of reading a scientific article, and to humanize scientists. This course, aimed at second-year students, will help students bridge the transition between introductory and upper level courses, and also provide a gateway to independent research experiences.

Intended Learning Outcomes

Successful completion of this course will result in students who are able to:

- Explain the creative, ongoing process of scientific research – from securing funding, to carrying out experiments, to publication
- Determine what information they need to know to appropriately analyze a scientific paper
- Read a primary scientific paper
    - elucidate hypotheses/questions posed
    - analyze and interpret the data within
    - diagram the various experimental methods used in generating the data
- Propose and evaluate follow-up experiments that continue a line of scientific investigation
- Strategically search and access scientific literature

- Clearly communicate specialized knowledge to a wider, non-expert audience
- Be aware of the human element of scientific research
- Be active learners who are intentional about their education choices

Course Materials

- Course materials will be posted to the course Sakai site regularly.
- Prof. Liu emails the class frequently. You are expected to check your Pomona email account for these emails and to read them.

COURSE OVERVIEW

Assessments

Final Grade Calculation	
Homework:	20%
Participation:	20%
Course Project:	35%
Check-in exams:	25%

Grading Scale			
A	93-100	C	73-76
A-	90-92	C-	70-72
B+	87-89	D+	67-69
B	83-86	D	63-66
B-	80-82	D-	60-62
C+	77-79	F	≤59

There is no curve for this course – you need only worry about your own performance. Please note that an "A" grade represents excellent mastery and intelligent discussion of concepts covered in this course.

Your Tasks

Before class: You will frequently be given initial assignments to work on as an individual before class. You should complete these assignments in your **course notebook**. Your assignments will be graded based on effort and completeness – sometimes your notebook will be evaluated at the start of class and other times, Prof. Liu will collect your entire notebook.

In class: During our class meeting time, you will frequently function as a member of a Learning Team, discussing and examining primary literature as a unit. Your team effort and participation in class discussions is part of your weekly participation grade.

Actively participating in this learning cycle of preparing and then engaging in discussions in class will allow you to achieve the intended learning outcomes of the course.

Reflection Sheets (5 pts/ea): Due on specified Fridays at noon (Sakai OR email)

Performance Evaluations (3 pts/ea): Due on specified Fridays at noon (Sakai OR email)

Check-in exams: Students will be asked to read a paper outside of class and then answer questions during an in-class, open-notebook "exam".

Course Project: Students will prepare a poster-presentation and written summary of a primary paper **related** to those we read in class (e.g. cites one of the papers, is written by one of the authors, etc.). Additional information and rubrics will be provided.

Pick paper (10 pts)

Prepare written summary and analysis (15 pts)

Prepare poster draft for peer review (15 pts)

Peer review posters (10 pts)

Present poster at symposium (40 pts)

Final paper (60 pts)

Grading Policy: Any query regarding scores on graded assignments or exams should be presented within three days of return of the assignment/exam. It is the student's responsibility to meet with the professor to make any adjustments. Please note that Prof. Liu reserves the right to regrade the entire submission, and as a result, she may raise or lower your entire score. After three days, all scores become final and unalterable.

Attendance: Attendance in class is mandatory in an active learning environment. In addition to mastering the material yourself, you are responsible for assisting the other members of the class in their understanding of the material. You must not miss class. Please be respectful of Prof. Liu and your fellow classmates and show up to class on time. You can expect your grade to drop substantially with 3 or more absences. Valid reasons for missing class are serious illness, religious observations or family emergencies. **You are responsible for handing in all assignments on time and obtaining all activities, regardless of missed classes.**

Late policy: For all assignments, late work will be accepted. However, for every 24 hours that the assignment is tardy, a 10% deduction will be applied to your grade on that assignment.

Special circumstances: If there are special circumstances, such as illness of other form of emergency, which should be taken into account with regard to any of the stated class policies, please inform Prof. Liu as soon as possible so that alternative arrangements can be made.

Academic Accommodations: Pomona College is committed to providing equal opportunity for participation in all programs, services and activities. Prof. Liu asks students who may need accommodations to assure their success to see the appropriate staff member in the Dean of Students Office and then come see her during office hours *before* the third week of class.

Academic ethics and integrity policy: You are expected to abide by the Pomona College Standards of Academic Integrity. For the official policy go to: http://pomona.catalog.acalog.com/content.php?catoid=14&navoid=2524. Plagiarism, whether deliberate or unintentional, and cheating on examinations, are not acceptable.

Calendar (subject to change)

SPRING 2020

SUNDAY	MONDAY	TUESDAY	WEDNES.	THURS.	FRIDAY	SAT.
JAN 19	20	21 **INTRODUCTION**	22	23 **INTRODUCTION**	24	25
26	27	28 **START PAPER 1**	29	30 **PAPER 1**	31 **PERFORMANCE EVALUATION**	FEB 1
2	3	4 **PAPER 1**	5	6 **PAPER 1**	7	8
9	10	11 **START PAPER 2**	12	13 **PAPER 2**	14 **REFLECTION**	15
16	17	18 **PAPER 2**	19	20 **PAPER 2**	21	22
23	24	25 **CHECK IN 1** **N.BOOK CHECK**	26	27 **START PAPER 3**	28 **PERFORMANCE EVALUATION**	29
MAR 1	2	3 **PAPER 3**	4	5 **PAPER 3**	6	7
8	9	10 **PAPER 3**	11	12 **PAPER 3**	13 **REFLECTION**	14
15	16 SPRING BREAK	17 SPRING BREAK	18 SPRING BREAK	19 SPRING BREAK	20 SPRING BREAK	21
22	23	24 **START PAPER 4**	25	26 **PAPER 4**	27 NO CLASSES	28
29	30	31 **PAPER 4**	APR 1 **PAPER CHOICE DUE**	2 **PAPER 4**	3	4
5	6	7 **CHECK IN 2**	8	9 **START PAPER 5**	10 **PAPER DRAFT AUTHOR**	11
12	13	14 **PAPER 5**	15	16 **PAPER 5** **N.BOOK CHECK**	17 **REFLECTION**	18
19	20	21 **PEER REVIEW**	22	23	24 **POSTER PRESENTATION**	25
26	27	28 **PAPER 6**	29	30 **PAPER 6**	MAY 1	2
3	4	5 **WRAP UP**	6 **FINAL PAPER DUE**	7 READING DAY	8 READING DAY	9
10	11 FINALS	12 FINALS	13 FINALS	14 FINALS	15 FINALS	16