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2020

Syllabus

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Fire and Ice
Chem 444A
Spring 2015
Professor Christopher Bauer

SOME say the world will end in fire,
Some say in ice.
From what I've tasted of desire
I hold with those who favor fire.
But if it had to perish twice,
I think I know enough of hate
To know that for destruction ice
Is also great
And would suffice.

-- Robert Frost

This Inquiry Course will explore the perception, movement, creation, understanding, and use of heat. Our exploration provides us the freedom to explore across physics, chemistry, biology, physiology, earth system science, history, sociology, psychology, and literature. This is a daunting task. There is no single text to follow. There is no linear path to this breadth of understanding. I'm not an expert in all of these fields, and as I have been gathering information for us, I have been finding out how much I don't know. So, we will be learning together.

What you can expect from me:

I apologize ahead of time for glitches in the course structure. I will try to play off your interests in deciding what we will investigate from week to week. My role is to facilitate your learning -- finding a variety of approaches to help you grow intellectually.

What I expect from you:

Patience, presence, and perseverance. Patience for the glitches. Presence at the class meetings. Perseverance with the subject matter -- after all, we're only trying to re-construct in your heads in one semester what took many minds 300 years to develop and put to use.

Christopher F. Bauer, Principal Investigator

This material is based upon work supported by the National Science Foundation under Grant No. 1245730.

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This is not the only difference.

The instructional approach will involve you in activities, discussions, simulations, and projects that help you to construct an understanding of the scientific ideas concerning heat and how those ideas play out in all of the fields mentioned. The course number does start with CHEM, so you can expect that I may favor chemistry ideas.

How we do things is as important as what we do.

Most of the time, you'll be working in groups. In some ways, this makes things easier; in some ways, harder. It might be easier because the old adage "two heads are better than one" applies. It may be more difficult because you have to risk expressing your ideas out loud and to struggle with expressing things about which you are not fully confident. It is important to do that. To help with this, we will often use a structure where group members have assigned roles. This simplifies the number of things to which you need to attend.

Intellectual goals:

- *To enhance your understanding of heat and energy, and of science as a way of knowing.*
- *To increase your understanding of how the world works and your ability to apply and express this knowledge confidently.*
- *To increase your awareness of your own thinking processes.*

Instructor: Prof. Christopher F. Bauer
W108 Parsons arrange meetings at class or by email
e-mail chris.bauer@unh.edu
mailbox Chem Dept Office, Parsons W115
phone Chem Dept 862-1550

Materials:

You will need a calculator for class (cell phone may be used).
Most material will be provided or posted on Blackboard.
Or placed on Dimond Library or Chem Lib reserve.
Regularly you will need eye protection. You may already own something. If you need to purchase (\$5), go to Chem Stockroom (\$, check, or Cats Cache only). WILL NEED AS SOON AS THURS.

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Schedule: Tues and Thurs 3:40 - 5:00 pm. Parsons room S150.

Grading:

	<u>Points</u>	<u>Comments</u>
Attendance & participation	375	15 pts per day, allows for absences
Group notes from class	66	3 pts each, est. 1 per day
Group products at class	50	5 pts each, est. 1 per week
Individual reading notes	44	2 pts each, est. 1 per day
Written reflections or other Assignments	40	5 pts each, est. 1 per week
Individual project poster	75	one time, end of semester
Individual project written paper	75	one time, end of semester
Group/individual challenges	200	50 pts each, every several weeks
Cooperation points	25	you can only lose these
Collaboration points (bonus)		you can distribute at mid and end
Surveys and interviews	50	10 pts each focus group (3) 20 pts all surveys
Total	<u>1000</u>	

Based on projections, the grade scale should go along with A/B/C/D/F thresholds of 900/810/720/630. I will not raise the threshold values, but I may lower them if I believe that deserving work is not receiving an appropriate grade. adjustments if that does not lead to a fair assessment of your work.

Attendance & Participation

This course is hands-on and discussion-rich. You have to be here and be involved -- that benefits you and everyone else. If I notice your participation is weak, I will speak with you before I make any adjustments to these points. There is an allowance for 3 absences.

Group notes/products: I encourage you to maintain your own set of class notes, as you would for any class. In addition to that, we will regularly (nearly every class) have a set of notes produced as the result of an activity, or a product, such as a poster. I will collect these, or photograph them, and post them on Blackboard.

Grp notes: 3 = really good, 2 = could be better, 1 = not so good, 0 = nothing

Products: 2 = satisfactory, 1 = not satisfactory, 0 = not done

All group members get the same score.

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Daily reading notes: For each class, you will have had to read or do something. Bring notes concerning that. These can be a bullet point list of observation, ideas, summary statements. The notes will be useful in subsequent discussions.

Collected or checked: 2 = satisfactory, 1 = could be better, 0 = not turned in

Written Reflections: These may include writing briefly about readings, synthesizing past class work, or responding to specific questions. These will happen about once a week. Scored for quality on a 5 pt scale according to the depth of thought demonstrated and connections to evolving ideas. These should represent the evolution of your thinking about the concepts we are discussing. Treat it as “here’s what I think or know at this point”.

5 = exceptionally insightful, 4 = illuminating, 3 = OK, 2 = not much depth, 1 = seems perfunctory, 0 = not turned in

Group or individual challenges: We will have occasional tasks that provide you the opportunity to show me the sum of your learning up to that point. These will happen every several weeks. You can call these tests if you like.

Individual project: This involves taking a more detailed look at some aspect of heat beyond what we have discussed in class and presenting your understandings by means of a poster. One of the last class days will be a public poster session in the hallway to which folks outside of our class will be invited. Evaluation will include input from me, you, and visitors.

Individual project paper: This will be a written version of the poster information, where you have the chance to lay out your reading, thoughts, and arguments in a coherent fashion. This will be reviewed only by me. This must be original work.

Focus Groups and Surveys Focus groups will be scheduled at roughly monthly intervals. Surveys will be announced and are typically available through Blackboard for a window of time.

Collaboration awards: Happens twice – at spring break, and at end of semester. Each student has 20 points to hand out each time. The most you can give to someone at a time is 5 pts. You can give zero. Awards are blind -- the receiver will not know from whom the points come. The maximum value that one can earn is 40 pts.

Cooperation points: You have an account containing 25 points. If your behavior becomes counterproductive, I can deduct points. I will have a chat with you if I feel the need to do this.