A Gamma-Ray burst event from a nearby star races through interplanetary space at the speed of light, colliding with the atmosphere of the Earth and flooding the planet with radiation. As part of our discussion we will discuss the potential origins of these events and the probability that we might suffer such a “Cosmic Catastrophe.”

Credit StSci/NASA

Instructor – Dr. Chick Woodward
Thurs. 10:10AM – 12:05PM PAN 210

Instructor Contact Information
Academic Email: woodw024@umn.edu
Phone: 612 624 0254
Office: 327 Shepard Lab
Office Hours: Fri 11:00AM – 11:59AM or by appointment
Moodle3.0 Site: https://ay16.moodle.umn.edu/course/view.php?id=36297

COSMIC CATASTROPHE FRESHMAN SEMINAR (2 credits)

Outline

This seminar will explore how the evolution of bodies in the solar system where effected by “cosmic impacts and other catastrophes,” with special emphasis on how such events effected the biosphere of the Earth. We will discuss the history of the solar system, from its inception through the current epoch, and explore how comets, asteroids, and collisions between large and small objects “disturb” the solar system. We will also focus attention on the nature of scientific discovery and debate by studying views on the great Cretaceous Extinction event. We shall explore how this scientific conversation led to deeper insight into the evolution of complex terrestrial bio-systems and our quest to identify which regions in the solar system may harbor life at present or may have supported life in the past. The necessary conditions for supporting life in the Universe will also be discussed. The primary text for our seminar is Death from the Skies (P. Plait, 2009 [Viking Penguin]), supplemented by other directed readings. We will also explore the link between science and science fiction related to our fascination cosmic impacts as seen through the eye of the media and popular culture.

The material is presented in a seminar format, wherein the instructor and the students share in the pedagogical process through discussions, readings, and presentations. My
role as the instructor is that of a facilitator. Your role as a participant is to utilize the text, ancillary reading materials, multimedia presentations, class discussion, and web forum exchange as seeds for further exploration and inquiry. You should come to class prepared to discuss issues in the reading assignments, other assigned activities, and materials presented as part of our seminar dialogue.

Questions That We As A Seminar Group Will Discuss and Explore

- Why are we driven to study the Cosmos?
- What makes a planet “habitahle” with a biosphere conducive to life?
- Do we have a sufficient and comprehensive definition of “life?”
- How do scientists develop ideas, communicate discovery, and explain controversy?
- How common are planetary-wide extinctions?
- Can you become a “citizen scientist?”

EVALUATION METRICS AND OUTCOMES

Performance Evaluation

Your performance in the seminar will be evaluated on your: (1) weekly class attendance and participation, (2) completion of Moodle assignments, (3) in class response essay(s), (4) class group presentation, and (5) capstone paper.

There will be no “extra credit” opportunities and no “curve” will be applied to the aggregate course point totals. You are expected to all complete reading assignments and review of ancillary materials that I may assign prior to coming to seminar.

To receive a passing grade in the seminar you must complete and hand in to the instructor the in class writing responses, the final capstone paper, and actively participate in the development and delivery of group presentation. Each individual in the seminar will be evaluated and assigned a grade as a result of the following activities.

Weekly Moodle Assignments (12 total @ 10pts ea.): 120pts
Weekly Class Attendance and Participation (13 seminar days @ 5pts ea.): 65pts
“In Class” Moodle Writing Response (2 assignments @ 40pts ea.): 80 pts
“In Class” Group Presentation (1 assigned during semester @ 15pts ea): 15pts
Capstone Paper (1 assigned): 60 pts

Total Possible Points: 340 pts

Seminar Grade Bins

Performance Evaluation Requirements

Regardless of your point standing you must satisfactorily complete the group presentation, the in-class response(s), and capstone paper (submit by the proscribed deadline) obligations to receive a passing grade. Also, you must attend at least 90% of the scheduled seminar meetings (PAN 210 weekly THURS 10:10AM to 12:05PM).

- Cumulative points earned for assignments will be tracked within your Moodle grade book.

SEMINAR ASSIGNMENT MECHANICS

Weekly Moodle Posts

As part of the seminar, you will post short reactions to the “Weekly Moodle Forum” on the class Moodle site. The narrative response is required prior to the next seminar meeting – the “PRE-Seminar” post. As instructor, I will moderate and review all posting to the seminar site, and the expectation for students is that you will have read and potentially responded to issues and ideas offered by your peers.

“PRE-Seminar” Posting Structure: You are required to post a short discussion of your reaction (approximately 300 words maximum) to the assigned readings for the next class period on the class Moodle site. This reaction must be more than summary of the readings; it requires succinct expression of your interpretation of the context that thoughtfully integrates seminar discussion and connections to other areas of intellectual inquiry. Your reaction post also must include one (1) separate question (no more than 30 words long) that may be selected as a key talking point for the next seminar session.

You also are required to include in your post a reflection of your reaction our discussions, peer-group activities, multimedia presentations, etc. that occurred during the prior seminar meeting. This reaction must be more than a summary of the seminar; it must express your interpretation of the seminar experience. This should include a clear statement of at least one (1) new idea, viewpoint, or “take-away” that has made an impression on your “world-view.”

Your peers will be able to read your posts, and may also respond to issues and ideas that you provide.

All electronic “PRE-Seminar” postings are due by 11:55PM on each TUES prior to seminar on THURS. Further instructions on the content and format and the seminar Moodle site.

The FIRST required posting is 13 September 2016.
The will be no required post on Tuesday 22 November 2016.
The LAST required posting is 06 December 2016.
Moodle Grading Rubric:

You will be assigned:

- Ten (10) to six (6) points if your post is thoughtful, integrates one additional new source’s (including citation, e.g., URL link) content into your post, including a including citation (e.g., URL link or article title, author, date, page number), contains no writing errors, has a well-formulated question, and indicates that you reviewed the postings of your classmates;

- Five (5) to one (1) points if your blog post is less than 50 words, identifies a new source but does not integrate its context into the broader response nor provide a citation, has occasional writing errors, and lacks a well-formulated question; and

- Zero (0) points if your blog post is less than 25 words, fails to be responsive in content and accuracy, lacks identification of a new source, contains a multitude of errors that distract from the content, contains no question, or is not submitted by the electronic deadline.

In Class Writing Responses

Two (2) “in-class” writing response activities will be given in lieu of normal seminar activities. The first is on **Thursday Oct. 20, 2016** and the second on **Thursday Nov. 17, 2016**. You will be given 1 hour to respond to a provided prompt, submitting your response electronically via the Moodle portal. **This is an independent assignment; you must create your own original response.** You are not permitted to collaborate, discuss, etc. the prompt with other students. Seminar will not meet that day. You can access Moodle from your place of choice.

Capstone Activity & Paper

A 5-page (~1,500 words) capstone paper (or equivalent creative endeavor) is required and is due electronically in *.pdf form by 11:55 PM on Weds. Dec 07, 2016. The capstone paper is a culminating expression of your understanding of course material and your pursuit of a course-related question or idea that reaches beyond our reading and discussion. Capstone papers may take many forms, including but not limited to an academic essay, a personal essay, a short story, a collection of poems, or a series of blog entries that explore your theme and your process of investigation. **You must submit your theme and a tentative format for approval no later than 11:55PM, Friday 18 Nov. 2016 to the Moodle folder; failure to meet this requirement will result in a loss of 20 pts (i.e., 33% reduction in possible score).**

On the final day of seminar (08 Dec 2016), each individual will be allotted ~7 min to summarize their capstone exposition in class.
Conduct Expectations, Academic Standards and Communication

Seminar Policies

University (http://advisingtools.class.umn.edu/cgep/studentconduct.html) scholastic conduct and (http://advisingtools.class.umn.edu/cgep/classroomprocedures.html) classroom procedures will be followed. You are responsible for being familiar with these. Students are welcome to work together, exchange ideas, etc. However, each student is responsible for submitting original work for evaluation (including proper citations). The use of cell phones or the sending of text messages during a quiz or an exam will be understood to be an act of academic dishonesty and shall be grounds for awarding a grade of F or N for the course.

To provide an uninterrupted seminar environment and to promote discussion without distraction, use of cell phones, pagers, text message, instant messaging, i-chat devices, and Ipods™ are not permitted in the classroom. You must turn these devices off and stow them away prior to the start of seminar.

Academic Integrity and Course Materials

The University expects the highest standards of honesty and integrity in the academic performance of its students. Any act of scholastic dishonesty is regarded as a serious offense, which may result in expulsion. Scholastic dishonesty is defined as plagiarizing; cheating on assignments or examinations; engaging in unauthorized collaboration on academic work; taking, acquiring, or using test materials without faculty permission; submitting false or incomplete records of academic achievement; acting alone or in cooperation with another to falsify records or to obtain dishonestly grades, honors, awards, or professional endorsement; altering, forging, or misusing a University academic record; or fabricating or falsifying data, research procedures, or data analysis. Aiding and abetting an act of scholastic dishonesty is also considered a serious offense with the same possible consequences. Students may not make commercial use of their notes of lectures, (i.e., post them on social media accounts, course note websites, etc.) or University-provided materials without the express written consent of the instructor. Failure to abide by these requirements will automatically result in the assignment of a grade F or N and immediate referral to the Office of Student conduct for further sanction(s) as required.

Special Needs

The University of Minnesota is committed to providing all students equal access to learning opportunities. Disability Services (DS) is the campus office that works with students who have disabilities to provide and/or arrange reasonable accommodations.

- Students who have, or think they may have, a disability (e.g. mental health, attention, learning, vision, hearing, physical or systemic), are invited to contact
DS to arrange a confidential discussion at 612-626-1333 (V/TTY) or ds@umn.edu.

- Students registered with DS, who have a letter requesting accommodations, are encouraged to contact the instructor early in the semester to discuss accommodations outlined in their letter.

Any students with special learning needs (http://diversity.umn.edu/disability) must contact their professor during the first two weeks of class. If you have known absences for legitimate University or personal reason during the semester, please contact me at least one-week in advance to make the necessary arrangements.

**Mental Health and Stress Management**

As a student you may experience a range of issues that can cause barriers to learning, such as strained relationships, increased anxiety, alcohol/drug problems, feeling down, difficulty concentrating and/or lack of motivation. These mental health concerns or stressful events may lead to diminished academic performance or reduce your ability to participate in daily activities. University of Minnesota services are available to assist you with addressing these and other concerns you may be experiencing. You can learn more about the broad range of confidential mental health services available on campus via http://www.mentalhealth.umn.edu

**Contact and Communication**

Email is the good method to contact me if you have question. *I read my University account normally once per day and will respond to queries within ~48 hrs.* Else, call or drop by my office. **Please put ast1905 in the subject line,** as spam filters, etc. may redirect your message to /dev/null.
### Seminar Topics and Reading Assignments from Primary Text

<table>
<thead>
<tr>
<th>Wk.</th>
<th>Class Dates</th>
<th>Topics/Themes</th>
<th>Readings*</th>
</tr>
</thead>
<tbody>
<tr>
<td>01</td>
<td>08 September</td>
<td>Seminar Intro, Origins and Conditions for Life</td>
<td>PP Int, Syllabus</td>
</tr>
<tr>
<td>02</td>
<td>15 September</td>
<td>Impacts, Craters, KT Extinction</td>
<td>PP Chap1</td>
</tr>
<tr>
<td>03</td>
<td>22 September</td>
<td>The Temperamental Sun/The Role of CO2 on “Habitability”</td>
<td>PP Chap2</td>
</tr>
<tr>
<td>04</td>
<td>29 September</td>
<td>Exploding Stars in The Neighborhood</td>
<td>PP Chap3</td>
</tr>
<tr>
<td>05</td>
<td>06 October</td>
<td>Comic Blow Torches/Life in Extreme Environments</td>
<td>PP Chap4</td>
</tr>
<tr>
<td>06</td>
<td>13 October</td>
<td>Exotica and Black Holes</td>
<td>PP Chap5</td>
</tr>
<tr>
<td>07</td>
<td>20 October</td>
<td><strong>In Class” Moodle Response #1</strong></td>
<td></td>
</tr>
<tr>
<td>08</td>
<td>27 October</td>
<td>Aliens &amp; ET: Sci vs. SciFi</td>
<td>PP Chap6</td>
</tr>
<tr>
<td>09</td>
<td>03 November</td>
<td><strong>No Class – Work on Group Presentations</strong></td>
<td></td>
</tr>
<tr>
<td>10</td>
<td>10 November</td>
<td>The Death of the Sun with Group Presentations</td>
<td>PP Chap7</td>
</tr>
<tr>
<td>11</td>
<td>17 November</td>
<td><strong>In Class” Moodle Response #2</strong></td>
<td></td>
</tr>
<tr>
<td>12</td>
<td>24 November</td>
<td>Thanksgiving Break</td>
<td>PP Chap8</td>
</tr>
<tr>
<td>13</td>
<td>01 December</td>
<td>Cosmology &amp; “Universal Fate(s)”</td>
<td>PP Chap9</td>
</tr>
<tr>
<td>14</td>
<td>10 December</td>
<td>Capstone Highlights and Seminar Summary with Presentations</td>
<td></td>
</tr>
</tbody>
</table>

- *Readings from primary seminar text: PP = *Death from the Skies, P. Plait*

[rev 2016Aug30 © cew – Subject to Change]