

**Instructor:** Dr. Dorian J. Burnette  
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**Office Hours**  
11 a.m.-12 p.m. Mon, Wed, Fri  
9:30 a.m.-10:30 a.m. Tue, Thu  
and by appointment

I encourage you to talk to me individually whenever you need to discuss your progress in the course or whenever you have a topic of special interest you want to discuss individually.

### **COURSE WEBSITE**

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[www.djburnette.com/classes/globalchange/](http://www.djburnette.com/classes/globalchange/)

### **COURSE TEXTBOOKS**

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- Elton, Charles S., 1958. *The Ecology of Invasions*. Wiley, NY.
- Houghton, J., 2009. *Global Warming, the Complete Briefing*. Cambridge University Press.
- IPCC, 2007. *Climate Change 2007: The Physical Science Basis*. Contribution of Working Group I to the Fourth Assessment Report of the Intergovernmental Panel on Climate Change [Solomon, S., D. Qin, M. Manning, Z. Chen, M. Marquis, K.B. Averyt, M. Tignor, and H.L. Miller (eds.)]. Cambridge University Press.
- You will need to obtain the books by Elton (1958) and Houghton (2009). Digital copies of the IPCC (2007) report, other important peer-reviewed articles, and videos will be supplied via the course website.

### **ABOUT THE COURSE**

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This course will review important issues of anthropogenic global change. It will concentrate on the human-enhanced greenhouse effect and climate change, and will cover the global energy balance, greenhouse gases, modern and past climate variability, climate modeling, observed climate changes, future climate projections, and carbon sequestration. We will also review the stratospheric ozone balance, land cover change, biological invasions, and the biodiversity crisis. The course will be based on my lectures, assigned readings (including supplements written by Dave Stahle), and your own independent research.

### **GRADES**

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Your grade is completely determined from the total number of points earned during the semester. These points come from 1) three exams, 2) an extended abstract on your research project, and 3) a 20- to 30-minute presentation on your research project. Final grades will be determined from a total of 500 points:

Grade	Points Needed	Average Percentage
A	450	90%
B	400	80%
C	350	70%
D	300	60%

**Exams:**

Three exams worth 100 points each will be given. Each of these exams constitutes 20% of your final course grade, and will take the format of fill in the blank and discussion questions.

Exams can be made up, but you must have a legitimate, verifiable, and an unavoidable reason. If you know you are going to be absent, then please make arrangements for a makeup before the exam. If you miss an exam because of an unforeseen emergency, arrangements to make it up must be made as soon as you return to campus. Please note that makeup exams will be in the same format, but may not ask the same questions. The last day to makeup an exam is Dead Day, 4 May 2012.

**Research Project:**

You will complete a research project on a topic of your choice relevant to global change, and give a 20- to 30-minute presentation to the class at the end of the semester. Instead of writing and turning in a large manuscript though, you will turn in what is called an “extended abstract.” These are 5-10 page summaries of your research project with 3-5 figures/tables. Sample extended abstracts from the American Meteorological Society and from this class are available on the course website. Please consult with me on your research topic, and please make sure to focus on genuine peer-reviewed research for your citations. There is a lot of trash on the web regarding global change, especially on climate change. If you have any questions, please don't hesitate to come see me.

I encourage you to conduct some sort of analysis of real world data. This has become increasing easy with the various web tools that have been built by major research organizations and others. The Royal Netherlands Meteorological Institute, for example, has built the KNMI Climate Explorer that allows you to access and analyze regional or global climate observations and predictions. But there are many other opportunities for manipulating biological, physical, or socioeconomic data.

**STUDENT CONDUCT**

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**Academic Dishonesty:**

Cheating, plagiarism, or any other form of academic dishonesty will not be tolerated. Cases of academic dishonesty will be dealt with in accordance with the policies set forth in the University's Catalog of Studies. It is your responsibility to understand these policies. A lack of understanding is not an adequate defense against a charge of academic dishonesty. The academic honesty policy in the 2011-2012 Catalog of Studies is available at <http://catalogofstudies.uark.edu/2882.php>.

**Cell Phones, Laptops, Tablets:**

The use of cell phones, text messaging, laptops, or tablet computers for purposes other than note taking is not allowed during class. Flagrant violation of this policy will result in you being dismissed from class.

## STUDENTS WITH DISABILITIES

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It is the student's responsibility to request accommodations each term from the Center for Educational Access (ada@uark.edu or 479-575-3104). Once you receive your documentation from CEA, you must schedule a meeting with me to provide me with the paperwork and discuss any accommodations needed for examinations and class materials.

## INCLEMENT WEATHER POLICY

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In the event of inclement weather class will be held unless the University is closed. The University's inclement weather policy is available at <http://emergency.uark.edu/11272.php>. Students should use their best judgment in determining whether it is safe for them to make it to campus. If you are unable to make it to the university on the day of an exam as a result of inclement weather, please e-mail me ASAP.

## COURSE SCHEDULE

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**Note:** This schedule is tentative, and will likely see revision throughout the semester. These revisions will be announced in class and updated in this syllabus on the course website.

<b>17 January</b>	<b>Introduction</b>
<b>19 January</b>	<b>No Class</b>
<b>24 January</b>	<b>Unintended Consequences of Human-Environment Interaction</b> [Micklin 2007]
<b>26 January</b>	<b>Historical Overview of Anthropogenic Climate Change</b> [Houghton (2009) pages 1-33, Dave Stahle Supplement, IPCC (2007) Chapter 1]
<b>31 January</b>	<b>Greenhouse Gases and Aerosols</b> [Houghton (2009) pages 34-68 and IPCC (2007) Chapter 2, Gerlach 2011]
<b>2 February</b>	<b>Climate Variability and Using the KNMI Climate Explorer</b> [Houghton (2009) pages 69-92, KNMI Climate Explorer Tutorial, Dave Stahle Supplement]
<b>7 February</b>	<b>Modern Climate Observations</b> [IPCC (2007) Chapter 3, Diffenbaugh et al. (2008), Meehl et al. (2009)]
<b>9 February</b>	<b>Modern Climate Observations</b> [IPCC (2007) Chapters 4 and 5; Rosenzweig et al. (2008)]
<b>14 February</b>	<b>Exam 1</b>
<b>16 February</b>	<b>Paleoclimatology</b> [IPCC (2007) Chapter 6 and Richard Alley AGU Keynote]
<b>21 February</b>	<b>Paleoclimatology</b> [Stahle et al. (in press)]

<b>23 February</b>	<b>Climate Modeling</b> [Houghton (2009) pages 93-134 and IPCC Chapter 8]
<b>28 February</b>	<b>Climate Modeling</b> [Allison et al. (2009); Cook et al. (2009)]
<b>1 March</b>	<b>Earth's Energy Imbalance and Attribution</b> [Hansen et al. (2005, 2006)]
<b>6 March</b>	<b>Earth's Energy Imbalance and Attribution</b> [IPCC (2007) Chapter 9 and Lean and Rind (2008)]
<b>8 March</b>	<b>Climate Projections</b> [IPCC (2007) Chapter 10]
<b>13 March</b>	<b>Climate Projections</b> [Houghton (2009) pages 137-234 and IPCC (2007) Working Group 2 Technical Summary]
<b>15 March</b>	<b>Exam 2</b>
<b>20 March</b>	<b>No Class – Spring Break</b>
<b>22 March</b>	<b>No Class – Spring Break</b>
<b>27 March</b>	<b>Climate Change Uncertainty</b> [Houghton (2009) pages 260-287]
<b>29 March</b>	<b>Climate Change Uncertainty</b> [Oreskes (2007) and IPCC Uncertainty Guidance for AR5 (Mastrandrea et al. 2010)]
<b>3 April</b>	<b>Carbon Sequestration</b> [IPCC Special Report (2005) Technical Summary]
<b>5 April</b>	<b>Economics of Climate Change</b> [Stern (2006) and Nordhaus (2007)]
<b>10 April</b>	<b>Ozone</b> [IPCC Special Report (2005) Technical Summary and Hassler et al. (2011)]
<b>12 April</b>	<b>Land Cover Change</b> [Ramankutty and Foley (1999) and Foley et al. (2005)]
<b>17 April</b>	<b>Biological Invasions</b> [Elton (1958) pages 1-159]
<b>19 April</b>	<b>Biodiversity Crisis</b> [Vitousek (1994)]
<b>24 April</b>	<b>Student Presentations</b>
<b>26 April</b>	<b>Student Presentations</b>
<b>1 May</b>	<b>Student Presentations</b>
<b>3 May</b>	<b>Student Presentations</b>
<b>8 May (1-3 p.m.)</b>	<b>Exam 3</b>