

## SEMESTER AT SEA COURSE SYLLABUS

### Colorado State University, Academic Partner

<b>Voyage:</b>	Spring 2018
<b>Discipline:</b>	International Education
<b>Course Number and Title:</b>	IE 272 - World Interdependence – Current Global Issues (Focus on Climate Change) (Section 1)
<b>Division:</b>	Lower
<b>Faculty Name:</b>	Steingrimur Jonsson
<b>Semester Credit Hours:</b>	3
<b>Prerequisites:</b>	None

### COURSE DESCRIPTION

Global warming has become a major issue that affects all societies in the world. We will stress the globality of global warming, as we travel to many different countries on our voyage and illustrate the many faces of it. We will cover basic aspects of energy budgets of the earth and the role of the forcing of climate change. The influence of humans on these budgets will be considered, with particular consideration given to the release of greenhouse gases to the atmosphere. The various feedback processes complicating the science of climate change will be demonstrated by examples. The carbon cycle will be addressed as well as the increased acidity of the ocean as a result of its uptake of CO<sub>2</sub> from the atmosphere. We will examine forecasts for climate change and the possible consequences for the Earth's climate, ecosystems and human societies. The possibilities for adapting to the changes occurring and how different countries can respond to those changes will be investigated. Also we will discuss how we can take actions to reduce the amount of greenhouse gases in the atmosphere (such as switching to renewable energy sources) to restore ecosystems around the world.

### LEARNING OBJECTIVES

The goal is for students to:

- understand the energy balance of the Earth and the atmosphere and how it is affected by greenhouse gases
- be able to assess the impacts of global warming in the areas we travel through and appreciate the globality of the problem
- recognize the changes that may occur with anthropogenic forcing
- understand how positive and negative feedbacks affect the climate system
- recognize ways to adapt to climate change and mitigate the effects of it
- to learn about policies on how mankind can mitigate the effects of climate change

### REQUIRED TEXTBOOKS

AUTHOR: Andrew Dessler  
TITLE: Introduction to modern climate change  
PUBLISHER: Cambridge University Press  
ISBN #: 9781107480674  
DATE/EDITION: 2<sup>nd</sup> edition, 2016

## TOPICAL OUTLINE OF COURSE

### Depart Ensenada, Mexico – January 5

**B1–January 8:** Introduction. What is climate and is it changing and how do we know if it is changing. The scale of things. Units and coordinate systems. The IPCC reports (Chapter 1)

**B2–January 10:** The climates we will experience along our journey. Air pressure and wind patterns as well as ocean circulation in different areas we will traverse. (TBA).

**B3–January 13:** Recent climate change. (Chapter 2 and IPCC report)

### Honolulu, Hawaii – January 12

**B4–January 15:** Past climate changes through Earth's history. (Chapter 2)

January 16–International Date Line crossing (Lost Day)

**B5–January 18:** Radiation and energy balance. (Chapter 3)

### No Class – January 19

**B6–January 21:** The energy balance of the Sun-Earth-Atmosphere system. The greenhouse effect. (Chapter 4)

**B7–January 23:** Review and exercises.

### Kobe, Japan – January 24-28

**B8–January 30:** The carbon cycle. (Chapter 5)

### Shanghai, China – January 31 - February 1

### In-Transit – February 2-3

### Hong Kong, SAR – February 4-5

**B9–February 7:** The carbon cycle. (Chapter 5 and IPCC report)

### Ho Chi Minh City, Vietnam – February 8-13

**B10–February 15:** Time lags in the climate system and radiative forcing. (Chapter 6)

### No Class –February 16

**B11—February 18:** Exam 1 (10%).  
Feedbacks and sensitivity in the climate system. (Chapter 6)

**Yangon, Myanmar — February 19-23**

**B12—February 25:** Why does the climate change? (Chapter 7)

**B13— February 27:** Prediction of future climate change. (Chapter 8 and IPCC report)

**Cochin, India — February 28 – March 5**

**B14—March 8:** Prediction of future climate change. (Chapter 8)

**No Class — March 7**

**B15—March 10:** Review and exercises.

**Port Louis, Mauritius — March 11**

**B16—March 13:** Why should we be concerned with the impacts of climate change?  
(Chapter 9)

**B17—March 15:** Exam 2 (10%).  
Exponential growth. (Chapter 10)

**B18—March 17:** Climate change policy. Adaptation, mitigation and geoengineering.  
(Chapter 11)

**Cape Town, South Africa — March 18-23**

**B19—March 25:** Mitigation policies. (Chapter 12)

**B20—March 27:** History of climate science and politics. (Chapter 13)

**B21—March 29:** Student presentations.

**Tema, Ghana — March 30 - April 1**

**Takoradi, Ghana — April 2-3**

**B22—April 5:** Long term policy to address climate change. (Chapter 14)

**B23—April 7:** Student presentations.

**Study Day — April 8**

**B24— April 10:** Review

**Casablanca, Morocco — April 11-14**

## **B25—April 16: Final Exam (25%)**

### **Arrive Bremerhaven, Germany — April 19**

#### **FIELD WORK**

Semester at Sea field experiences allow for an unparalleled opportunity to compare, contrast, and synthesize the different cultures and countries encountered over the course of the voyage. In addition to the one field class, students will complete independent field assignments that span multiple countries.

**Field Class attendance is mandatory for all students enrolled in this course. Do not book individual travel plans or a Semester at Sea sponsored trip on the day of your field class.**

Field Classes constitute at least 20% of the contact hours for each course, and are developed and led by the instructor.

#### **Field Class & Assignment**

The Field Class for this course will take place on Wednesday, 31 January, in Shanghai, China.

Field Class Title: The effects of the Arctic on the climate of China and the Monsoon wind field.

#### Field Class Description:

Visit to the Polar Research Institute of China which has a museum related to polar research. Later there will be a demonstration of Chinese research in the Arctic and Antarctic ending with a presentation of how the climate change in the Arctic affects the monsoon system and the climate in China.

Field Class Learning Objectives: To illustrate how climate change in one part of the world influences climate in another part far away.

#### **Independent Field Assignments**

Students in groups will maintain an Expedition Log for all days at sea. The log will include all available relevant measurements to our course, weather (cloud cover, humidity and atmospheric pressure), sea state, and relevant oceanographic parameters. A photo should be taken every day, while at sea, around noon to get an idea of the clouds, sea state and the color of the ocean. The second part of the entry should be descriptive or illustrative in nature, documenting the 'at sea' experience. Any experiences in port that add to the understanding of climate change are welcome in the log. Logs will be evaluated on the basis of completion (minority) and effort (majority). At a time to be decided towards the end of the semester, students in groups will deliver the log and a report based on the log (3-4 pages of text).

Ports-of-call reports: Students in groups will be assigned two ports-of-calls countries. In the port and in the country, students should note anything they find relevant to our course, which could for example include manmade structures to prevent erosion from rising sea level, deforestation, land use, energy use, traffic, local food production, imported food. Each group will prepare 5-minutes power point presentations for the two different ports, including own photos, and turn in an essay (1-2 pages of text). The class will then discuss the reports presented. The students will be graded on how creative and able they are to apply concepts that have been covered in class to their observations and the quality of their essays and power point presentations.

## METHODS OF EVALUATION / GRADING SCALE

### GRADING SCALE

The following Grading Scale is utilized for student evaluation. Pass/Fail is not an option for Semester at Sea coursework. Note that C-, D+ and D- grades are also not assigned on Semester at Sea in accordance with the grading system at Colorado State University (the SAS partner institution).

Pluses and minuses are awarded as follows on a 100% scale:

<u>Excellent</u>	<u>Good</u>	<u>Satisfactory/Poor</u>	<u>Failing</u>
97-100%: A+	87-89%: B+	77-79%: C+	Less than 60%:
93-96%: A	83-86%: B	70-76%: C	
90-92%: A-	80-82%: B-	60-69%: D	

Class participation 10%  
2 exams 20%  
Observation journal 10%  
Group presentations & papers 15%  
Final Exam 25%  
Field Class 20%

### ATTENDANCE/ENGAGEMENT IN THE ACADEMIC PROGRAM

Attendance in all Semester at Sea classes, including the Field Class, is mandatory. Students must inform their instructors prior to any unanticipated absence and take the initiative to make up missed work in a timely fashion. Instructors must make reasonable efforts to enable students to make up work which must be accomplished under the instructor's supervision (e.g., examinations, laboratories). In the event of a conflict in regard to this policy, individuals may appeal using established CSU procedures.

### LEARNING ACCOMMODATIONS

Semester at Sea provides academic accommodations for students with diagnosed learning disabilities, in accordance with ADA guidelines. Students who will need accommodations in a class, should contact ISE to discuss their individual needs. Any accommodation must be discussed in a timely manner prior to implementation.

A letter from the student's home institution verifying the accommodations received on their home campus (dated within the last three years) is required before any accommodation is provided on the ship. Students must submit this verification of accommodations to [academic@isevoyages.org](mailto:academic@isevoyages.org) as soon as possible, but no later than two months prior to the voyage.

### STUDENT CONDUCT CODE

The foundation of a university is truth and knowledge, each of which relies in a fundamental manner upon academic integrity and is diminished significantly by academic misconduct. Academic integrity is conceptualized as doing and taking credit for one's own

work. A pervasive attitude promoting academic integrity enhances the sense of community and adds value to the educational process. All within the University are affected by the cooperative commitment to academic integrity. All Semester at Sea courses adhere to this Academic Integrity Policy and Student Conduct Code.

Depending on the nature of the assignment or exam, the faculty member may require a written declaration of the following honor pledge: "I have not given, received, or used any unauthorized assistance on this exam/assignment."

#### **RESERVE BOOKS FOR THE LIBRARY**

None

#### **FILM REQUEST:**

None

#### **ELECTRONIC COURSE MATERIALS**

None

#### **ADDITIONAL RESOURCES**

The following summaries from the latest (5<sup>th</sup>) assessment report from the Intergovernmental Panel on Climate Change (IPCC) can be obtained from the internet at the following links. They will also be available on board as pdf files.

[http://www.ipcc.ch/pdf/assessment-report/ar5/wg1/WG1AR5\\_SPM\\_FINAL.pdf](http://www.ipcc.ch/pdf/assessment-report/ar5/wg1/WG1AR5_SPM_FINAL.pdf)

[http://www.ipcc.ch/pdf/assessment-report/ar5/wg2/ar5\\_wgII\\_spm\\_en.pdf](http://www.ipcc.ch/pdf/assessment-report/ar5/wg2/ar5_wgII_spm_en.pdf)

[http://www.ipcc.ch/pdf/assessment-report/ar5/wg3/ipcc\\_wg3\\_ar5\\_summary-for-policy-makers.pdf](http://www.ipcc.ch/pdf/assessment-report/ar5/wg3/ipcc_wg3_ar5_summary-for-policy-makers.pdf)

[http://www.ipcc.ch/pdf/assessment-report/ar5/syr/AR5\\_SYR\\_FINAL\\_SPM.pdf](http://www.ipcc.ch/pdf/assessment-report/ar5/syr/AR5_SYR_FINAL_SPM.pdf)