

Science 320 -- Science, Technology & Culture
Energy and Sustainability
SUNY College at Cortland
Physics Department

Catalog Description: Relationship between scientific and technological developments and social changes throughout history. (3 sem hr.)

Required Texts: *Carbon-Free and Nuclear-Free: A Roadmap for U.S. Energy Policy*, Arjun Makhijani and
Insurmountable Risks: The Dangers of Using Nuclear Power to Combat Global Climate Change, Brice Smith

Course Information:
Spring 2009 Term, 3 credit hours
MWF 3:00-3:50 p.m.
Bowers 136

Professor Information:
Dr. Brice Smith
Bowers 143 (office)
Bowers 141 (lab)
brice.smith@cortland.edu

Office Hours:
MWF 9:00-10:00am and 12:30-2:00pm
(Please make an appointment if you would like to see me at another time.)

Attendance Policy: The course will revolve around in-class discussions and thus attendance is required. Excused absences may be worked out with the instructor ahead of time and will often require a separate meeting to be set up in order to catch up on what was missed in the lecture.

Evaluation of Student Grades will be based on the following components:

Attendance	10%
Weekly News Summary	25%
Other Weekly Assignments	30%
Final Group Project	35% (15% for first draft, 20% for final draft and presentation)

Each week students will typically be assigned two projects in addition to an average of 30 pages of required readings. The first assignment, which will be the same week-to-week, will be to find one story concerning that week's topic from one of the following news sources (the New York Times, Washington Post, L.A. Times, Chicago Tribune, Fox News, CNN, or the London Guardian) and to write a short (~500-600 word) summary of its context focusing on what it gets right and wrong and what important information or ideas it leaves out. The second assignment will vary weekly. It will typically be handed out on Wednesday and will be due the following Wednesday. These assignments may cover a range of activities from traditional problem sets to conducting elements of an energy audit in buildings on campus. In addition, a semester-long group project (4 to 5 students per group) will be assigned during the first week of class and will involve both library research and gathering real world data from on and off campus. Extra credit options such as evening documentary viewings/discussions and weekend field trips may also be scheduled. All such opportunities will be announced in class and via email.

Students with a Disability:

If you are a student with a disability and wish to request accommodations, please contact the Office of Student Disability Services located in B-40 VanHoesen or call (607) 753-2066 for an appointment. Information regarding your disability will be treated in a confidential manner. Because many accommodations require early planning, requests should be made as early as possible.

SCIENCE 320 -- Spring 2009

<u>Date</u>	<u>Topic</u>
Jan. 21	Introduction and Overview
Jan. 23, 26, 28	What is Energy and Where Does Our Energy Come From?
Jan. 30, Feb. 2	What is Sustainability?
Feb. 4, 6, 9	Fossil Fuels and Climate Change
Feb. 11, 13	Coal
Feb. 16, 18, 20	Oil and Natural Gas
Feb. 23, 25, 27, Mar. 2	Nuclear Power
Mar. 4, 6	Hydroelectric Power
Mar. 9, 11, 13	<i>Spring Break - No Classes</i>
Mar. 16, 18, 20	Wind Power
Mar. 23, 25, 27	Solar Power
Mar. 30	Future Technologies (wave, tidal, hot-rock geothermal, etc.)
April 1	The Future of the Grid (distributed grids, smart grids, V2G, etc.)
April 3, 6	Biomass and Biofuels
April 8, 10	Heating, Cooling, and Green Building Systems
April 13, 15	Transportation (Cars and Trucks)
April. 17	<i>Scholars Day - No Classes</i>
April 20	Transportation (Planes and Trains)
April 22, 24, 27, 29	Models for a Sustainable Energy System
May 1, 4	Presentation of Group Projects

SCIENCE 320 -- Spring 2009

Date	Weekly Reading Assignment
Jan. 21	<i>Carbon-Free and Nuclear-Free</i> Preface and Chapter One (pages xv – 13)
Jan. 23, 26, 28	<i>Annual Energy Review (2007)</i> Energy Perspectives (pages xix – xxxvi) <i>Carbon-Free and Nuclear-Free</i> Chapter Two (pages 14 – 27) (Supplemental) <i>Energy: From Source to Use</i> Chapter Two (pages 17 – 32)
Jan. 30, Feb. 2	<i>The Concept of Environmental Sustainability</i> (Supplemental) <i>Measuring up to Sustainability</i>
Feb. 4, 6, 9	<i>Insurmountable Risks</i> Section 1.2 (pages 12 – 26) (Supplemental) <i>Climate Change Synthesis Report</i> Summary for Policymakers
Feb. 11, 13	<i>Bringing Down the Mountains</i> Chapter Three (pages 68 – 100) (Supplemental) <i>Bringing Down the Mountains</i> Chapter Six (pages 173 – 206)
Feb. 16, 18, 20	<i>The Prize : The Epic Quest for Oil, Money & Power</i> Chapters Eight and Nine (pages 150 – 183) (Supplemental) <i>Just Oil? The Distribution of Environmental and Social Impacts of Oil Production and Consumption</i>
Feb. 23, 25, 27, Mar. 2	<i>Insurmountable Risks</i> Foreword (pages iii – vii) Section 2.5 (pages 96 – 99) Section 3.5 (pages 160 – 164) Section 4.5 (pages 229 – 232) Section 5.5 (pages 290 – 294) Chapter Six (pages 295 – 306) <i>Carbon-Free and Nuclear-Free</i> Appendix A (pages 181-192)
Mar. 4, 6	<i>Desert Solitaire: A Season in the Wilderness</i> Down the River (pages 151 – 195) (Supplemental) <i>Dams and Development</i> Chapters Three and Four (pages 73 – 133)

Date	Weekly Reading Assignment
Mar. 9, 11, 13	<i>Spring Break - No Classes</i>
Mar. 16, 18, 20	<p><i>Carbon-Free and Nuclear-Free</i> Section 3.A (pages 28 – 36)</p> <p><i>Insurmountable Risks</i> Section 2.3.2 (pages 65 – 70) Section 2.4.2 (pages 79 – 85)</p> <p>(Supplemental) <i>20 percent Wind Energy by 2030</i> Chapter One (pages 1 – 21)</p>
Mar. 23, 25, 27	<p><i>Carbon-Free and Nuclear-Free</i> Section 3.B (pages 37 – 45)</p> <p><i>Solar Energy: The Case for Action</i> Chapters One and Two (pages 1 – 7) Chapters Four through Six (pages 13 – 30)</p> <p>(Supplemental) <i>Photovoltaics and renewable energies in Europe</i></p>
Mar. 30, April 1	<p><i>Carbon-Free and Nuclear-Free</i> Sections 3.H through 3.K (pages 59 – 71) Sections 6.C and 6.E (pages 117 and 118-119)</p>
April 3, 6	<p><i>Carbon-Free and Nuclear-Free</i> Sections 3.C through 3.G (pages 45 – 59)</p> <p>(Supplemental) <i>Rush To Ethanol</i> Part II: Corn-Based Ethanol (pages 18 – 33)</p>
April 8, 10	<p><i>Carbon-Free and Nuclear-Free</i> Section 4.A (pages 73 – 83)</p> <p>(Supplemental) <i>Ground-source heat pumps systems and applications</i></p>
April 13, 15, 17, 20	<p><i>Carbon-Free and Nuclear-Free</i> Sections 4.B and 4.C (pages 83 – 94)</p> <p><i>Policies for Increasing Bicycle Transportation for Daily Commuter Trips</i></p>
April 22, 24, 27, 29, May 1, 4	<p><i>Carbon-Free and Nuclear-Free</i> Chapter Five (pages 95 – 111) Chapters Seven through Nine (pages 129 – 175)</p>