

Course title: China's Ecological, Agricultural & Environmental Challenges and Global Impacts (11:216:468).

Time: Fri 12:35-15:35, Spring 2016

Classroom: Foran Hall, Room 138B, SEBS

Instructors:

Ming Xu, Associate Professor, Department of Ecology, Evolution and Natural Resources,
Email: mingxu@crssa.rutgers.edu, Phone: 848-932-9211 Office hour: Friday 15:40
– 17:00, ENR Building 132

Bingru Huang, Professor, Department of Plant Biology and Pathology, Email:
huang@AESOP.Rutgers.edu, Phone: 848-932-6390

Justification: China's rapid economic growth has posed tremendous pressures on its environment and natural resources in the past decades, which has concerned many people within and outside of China. Meanwhile, many efforts have been invested at various scales in China to minimize the impacts and reverse the degradation processes, which has brought opportunities for studying and solving the complex cross-boundary environmental and ecological problems. The experience and solutions could also be used for other countries and regions beyond China for sustainable development. However, there are no such courses in School of Environmental and Biological Sciences, or anywhere on the New Brunswick campuses, specifically designed to introduce students to China's ecological and environmental issues. It is the intent of this course to fill this need. The course is designed for serving undergraduates and graduate students with both physical and social science backgrounds. This course also fits nicely within the goals of promoting international perspectives within our undergraduate program. Prerequisite: No

Learning Goals:

- 1) Create a natural resource management plan demonstrating an understanding of societal values and interests.
- 2) Think critically and solve problems using evidence-based reasoning.
- 3) Communicate effectively orally and through written text and graphics.
- 4) Evaluate ecology, evolution and natural resource management concepts in a global context.

Credit hours: 3

Text: China's Environment and the Challenge of Sustainable Development by Kristen A. Day (2005) (**Not required**)

Synopsis: This course will focus on major environmental and ecological issues in China in the past decades, such as pollutions, soil erosion, deforestation/reforestation, desertification and urbanization, as well as strategies to deal with the challenges. Driving forces, such as population pressure, economic growth, globalization, climate change and socio-political factors, will be examined through lectures and projects. The course will also introduce the growing opportunities (e.g. business, private industry, academia and government agents) in environment and conservation areas.

Course plan: This course will follow two 80 minute periods per week. The first period will consist of a general lecture with opportunity for discussion and the second period will consist of small group discussion where students will generate evidence-based position statements. To prepare for these discussions, students will complete small assignments where they compile evidences based on specific topics. The text and papers handed out during class will serve as resources for these assignments. Students will collaboratively complete 4 position statements during the semester.

Course Topics:

Introduction to China

Week 1: Introduction to China: Geography, climate, ecosystems and culture

Week 2: China's agriculture: Challenges and impacts

Position 1: Can China feed its people in the 21st century? Cropland area in China has declined steadily in the past decades due to rapid urbanization. With the continuing increase of population in the coming decades as well as environmental constrains, such as soil erosion and climate change, China is facing an increasing challenge on food production and security. Meanwhile, food production per unit area has significantly boosted in the past decades as a result of advances in technology and management practices. Will the food supply continue to beat the population pressure? Why? If not, what are your solutions? **(3-5 pages, single-spaced; you can use figures and tables to support your opinions; list data sources and references; you can choose your own title and format)**

Biodiversity and Climate Change

Week 3: China's natural ecosystems from tropical forests to gobi deserts

Week 4: Biodiversity: Challenges and opportunities

Week 5: Climate change and its impacts in China

Position 2: Will China find balance between the economic development and ecological protections? Conservation calls for more aggressive policies on protecting various ecosystems, while development needs land, water and other natural resources. Where is the trade-off? How to achieve it?

Week 6: **Midterm**

Pollution:

Week 7: Pollutions in China: Air

Week 8: Pollutions in China: Water
Week 9: Pollutions in China: Solid Waste
Week 10: Pollutions in China: Drivers and Solutions

Position 3: Is pollution avoidable during industrialization? China's rapid development has brought tremendous pressures on its environment, which has produced severe problems and calls for immediate solutions. Both market-based and regulation-based solutions have been proposed to the Chinese government. Which approach would you take if you were the Chinese president? Or if you have other ideas, give your recommendation and explain why it is superior.

Urbanization:

Week 11: Urbanization in China: Positive and Negative Impacts
Week 12: Urban Environment and Ecology
Week 13: Urban Landscape and Environmental Protection

Position 4: What are the pros and cons associated with rapid urbanization in China in terms of environmental and ecological impact? What lessons and experiences should China learn from the urbanized world, such as the US, particularly New Jersey?

Week 14: Final

Grading: Attendance 20%

Classroom discussion: 10%

Position statements 40% (These would be submitted as individual student papers. We acknowledge that the questions students will address in position statements are difficult and therefore, formative feedback will be given during discussion periods.)

Mid-term (Multiple choices and short answer questions) 30%