

The Global Environment Course 35949

Syllabus

Instructor	Prof. Seon Ki Park (hydromet.ewu@gmail.com; spark@ewha.ac.kr) Room 459, Engineering Building B
Room/Time	Room B153, Engineering Building B Mon. 15:30~16:45, Wed. 14:00~15:15
Office Hours	By appointment only. E-mail correspondence is strongly encouraged.
Class Limit	No limitation in student number.
Course Description	This course explores scientific findings on climate/environment change related to global warming, and complicated interactions and feedback mechanisms between climate change and various components of climate system. Part I covers fundamental knowledge on roles of components in climate system to climate change, including atmosphere, ocean, land surface, ecosystem and biogeochemical cycles. In Part II, climate sensitivity and feedback mechanisms of climate change will be studied, specifically on water vapor, cloud and lapse rate, ocean heat and circulation, terrestrial hydrology and vegetation, atmospheric chemistry, and biogeochemical and carbon cycles. Integrated themes for future climate change will be also addressed.
Texts and References	<ol style="list-style-type: none"> 1. NRC, 2010: <i>Advancing the Science of Climate Change</i>. The National Academies Press, 391 pp. 2. NRC, 2003: <i>Understanding Climate Change Feedbacks</i>. The National Academies Press, 152 pp. 3. Bridgman, H.A., and J.E. Oliver, 2006: <i>The Global Climate System: Patterns, Processes, and Teleconnections</i>. Cambridge University Press, 350 pp. 4. Steffen, W., and Coauthors, 2005: <i>Global Change and the Earth System: A Planet Under Pressure</i>. Springer, 332 pp. 5. Bonan, G.B., 2008: <i>Ecological Climatology: Concepts and Applications</i>. Cambridge University Press, 568 pp. 6. Trenberth, K.E., 2010: <i>Climate System Modeling</i>. Cambridge University Press, 880 pp.
Course Structure	Oral Lecture; Oral Presentations by Students (fully in English)

Course Requirements	Prerequisites: Environmental Science and Engineering II
Assignments	<ul style="list-style-type: none"> • Problems • Essay (English) • Term project: Oral presentation as a team
Assessment and Grades	<ul style="list-style-type: none"> • Attendance and Participation (5%) • Oral Presentation (20%) • Weekly Quiz (40%) • Homework (15%) • Term Project (20%)
Important Notes	<ol style="list-style-type: none"> 1. If you attend less than 5/6 of the total lectures, your academic record will be F. 2. Homework is due by 5 pm on the date announced. Students will be assessed a 20% penalty per day for late work, and work will not be accepted more than 2 days beyond the announced due date. 3. Submitting homeworks in time is very important! If you do not submit your homework once, you cannot get A. If you do not submit 4. your homework twice, you are guaranteed to get no better than C. I will strictly apply this rule no matter how good your records are in the exams.

Lecture Schedule

Week	Lecture Contents	
Week 1 (9/1)	Part I Introduction to Climate System	
Week 2 (9/6, 9/8)	Climate System: Atmosphere	Last day of changing course enrollment (9/7)
Week 3 (9/13, 9/15)	Climate System: Ocean	
Week 4 (9/20, 9/22)	Climate System: Land Surface	
Week 5 (9/27, 9/29)	Climate System: Ecosystem	
Week 6 (10/4, 10/6)	Climate System: Biogeochemistry	Last day of withdrawal (10/5)
Week 7 (10/11, 10/13)	Part II Climate Sensitivity	
Week 8 (10/18, 10/20)	Climate Change Feedback: Water Vapor, Cloud, Lapse Rate	Term Project Outline Due (10/18)
Week 9 (10/25, 10/27)	Climate Change Feedback: Sea-Ice	
Week 10 (11/1, 11/3)	Climate Change Feedback: Ocean Heat and Circulation	
Week 11 (11/8, 11/10)	Climate Change Feedback: Terrestrial Hydrology and Vegetation	
Week 12 (11/15, 11/17)	Climate Change Feedback: Atmospheric Chemistry	
Week 13 (11/22, 11/24)	Climate Change Feedback: Biogeochemistry and Carbon Cycle	Term Project Presentation (11/22)
Week 14 (11/29, 12/1)	Integrative Themes for Future Climate Change	
Week 15 (12/6, 12/8)	Global Climate Model; Regional Climate Model	
Week 16 (12/13, 12/15)	Wrap-up	