

课程大纲 COURSE SYLLABUS

1.	课程代码/名称 Course Code/Title	ESE5019 生态气候学 Ecological Climatology
2.	课程性质 Compulsory/Elective	专业选修课
3.	课程学分/学时 Course Credit/Hours	3
4.	授课语言 Teaching Language	English
5.	授课教师 Instructor(s)	曾振中
6.	是否面向本科生开放 Open to undergraduates or not	否
7.	先修要求 Pre-requisites	(如面向本科生开放, 请注明区分内容。 If the course is open to undergraduates, please indicate the difference.)
8.	教学目标 Course Objectives	
	(如面向本科生开放, 请注明区分内容。 If the course is open to undergraduates, please indicate the difference.) This course provides an overview on the role of land processes (vegetation and soil moisture dynamics, land-atmosphere exchanges) for the earth's climate system.	
9.	教学方法 Teaching Methods	
	(如面向本科生开放, 请注明区分内容。 If the course is open to undergraduates, please indicate the difference.) Lectures and lab exercises	
10.	教学内容 Course Contents	
	(如面向本科生开放, 请注明区分内容。 If the course is open to undergraduates, please indicate the difference.)	
	Section 1	Overview of main processes, feedbacks and interactions
	Section 2	Land surface observations
	Section 3	Land surface modelling
	Section 4	Land surface modelling (Exercises)
	Section 5	Land-climate feedbacks in models and observations

Section 6	Land-climate feedbacks (Exercises)
Section 7	The role of vegetation in the land-atmosphere interaction
Section 8	Outlook, current research questions

11. 课程考核
Course Assessment

(① 考核形式 Form of examination; ②. 分数构成 grading policy; ③ 如面向本科生开放, 请注明区分内容。
If the course is open to undergraduates, please indicate the difference.)

Attendance: 20%

Class Performance: 20%

Projects: 30%

Final Presentation: 30%

12. 教材及其它参考资料
Textbook and Supplementary Readings

Book:

Bonan, G. B. (2002). Ecological climatology: concepts and applications, Cambridge University Press.

Literatures including but not limited to:

Feddema, J. J., et al. (2005). "The Importance of Land-Cover Change in Simulating Future Climates." Science 310(5754): 1674-1678.

Foley, J. A., et al. (2005). "Global Consequences of Land Use." Science 309(5734): 570-574.

Ciais, P., et al. (2005). "Europe-wide reduction in primary productivity caused by the heat and drought in 2003." Nature 437(7058): 529-533.

Seneviratne, S. I., et al. (2006). "Land-atmosphere coupling and climate change in Europe." Nature 443(7108): 205-209.

Bonan, G. B. (2008). "Forests and climate change: Forcings, feedbacks, and the climate benefits of forests." Science 320(5882): 1444-1449.

Jung, M., et al. (2010). "Recent decline in the global land evapotranspiration trend due to limited moisture supply." Nature 467(7318): 951-954.

Seneviratne, S. I., et al. (2010). "Investigating soil moisture–climate interactions in a changing climate: A review." *Earth-Science Reviews* 99(3–4): 125-161.

Bonan, G. B. and S. C. Doney (2018). "Climate, ecosystems, and planetary futures: The challenge to predict life in Earth system models." *Science* 359(6375).