

## 课程大纲 COURSE SYLLABUS

1.	课程代码/名称 Course Code/Title	ESE5090 全球水文与环境前沿 Global Hydrology and Frontier of Environmental Science
2.	课程性质 Compulsory/Elective	专业选修课
3.	课程学分/学时 Course Credit/Hours	3/48
4.	授课语言 Teaching Language	英文
5.	授课教师 Instructor(s)	刘俊国
6.	先修要求 Pre-requisites	Hydrology and Water Resources
7.	<b>教学目标 Course Objectives</b>	
	<p>Global hydrology studies terrestrial hydrological cycle and water resources on a global scale, or it addresses human impacts on water systems in a globalized and telecoupled world. This course provides the fundamental concepts, numerical methods and latest findings of global hydrology and water use models, illustrates the most advanced topics related to global hydrology, e.g. water footprint, virtual water, food-energy-water nexus, water scarcity and security, and demonstrate the human's environmental footprints and sustainability. It provides students with a comprehensive overview of the interactions between human and water in a coupled natural and socio-economic system. It analyses the options for improving water supply and protecting the environment, emphasizing the need for international collaboration in a changing societal and environmental context.</p> <p>This course provides a novel interdisciplinary approach to water in a changing world, from an environmental change perspective and inter-related social, political and economic dimensions.</p>	
8.	<b>教学方法 Teaching Methods</b>	
	<p>Five-step teaching method will be used: teaching, reading, group discussion, presentation, and supervision. Students need to read a lot, work together in a team, and have opportunities to give presentation in class. Students will much participate this lecture and will gain not only professional knowledge but also presentation skills from this course.</p>	
9.	<b>教学内容 Course Contents</b>	
	<b>Section 1</b>	The first half of the course will cover the fundamental concepts and numerical methods of global hydrology and water use models.
	<b>Section 2</b>	The second half of the course will introduce the recent research progress in water scarcity assessment, water footprint, virtual water trade, and water security.
10.	<b>课程考核 Course Assessment</b>	
	<p>The overall course grade is determined by the following:  Participation in presentations and class discussion: 50%  Final exam: 50%</p>	

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

- 1、 Joseph Holden, 2013. Water Resources: An Integrated Approach. Routledge, London.
- 2、 Hoekstra et al., 2013. The Water Footprint of Modern Consumer Society. Routledge, London.
- 3、 Hoekstra et al., 2011. The water footprint assessment manual: setting the global standard. Earthscan, London.
- 4、 Hoekstra and Chapagain, 2008. Globalization of water: sharing the planet's freshwater resources. Blackwell Publishing, Oxford.
- 5、 Zhao X., Liu J.\*, Liu Q., Tillotson M.R., Guan D., Hubacek K., 2015. Physical and virtual water transfers for regional water stress alleviation in China. Proceedings of the National Academy of Sciences of the United States of America. 112(4): 1031-1035.
- 6、 Palmer M.A., Liu J., Matthews J.H., Mumba M., D'Odorico P., 2015. Sustainability requires green. Science. 349 (6248).
- 7、 Liu J., Zang C., Tian S., Liu J., Yang H., Jia S., You L., Liu B., Zhang M., 2013. Water conservancy projects in China: achievements, challenges and way forward. Global Environmental Change 23(3): 633-643.