Main Courses Description

Course name	生态水文学	Course code	04041003
English name	Ecohydrology		
Name of instructor	Jinhui Huang	Title of teacher	Professor
Class hours	32	Credits	2

Teaching methods (lecture or discussion and time arrangement of each class)

Combination of teaching and class discussion

1） Instructing students to write a critical review of related papers to train students' intensive reading skills of scientific and technological papers, critical thinking, and writing skills.

2） Instructing students to participate in the design of actual cases so that students can better integrate what they learned in actual work. Students are also required to submit a design report (in English) and make a presentation to explain their report, to improve their English writing and oral expression.

Brief introduction of the main contents

Content: Ecohydrology, 2 credits, and 32 class hours in total. This course mainly teaches the relationship among hydrology, meteorology, and ecological processes, including two core issues: how hydrological processes affect ecological processes, ecosystems, and landforms at different times, and how to feedback or influence hydrological processes. This course will introduce the laws of the hydrological cycle, transformation and balance in the ecosystem, and analyze the problems related to water in ecological construction, ecosystem management, and protection, such as the impact of ecosystem structure change on the balance and transformation process of water quality, water quantity and hydrological elements in the hydrological system; the changing pattern of water quality and water quantity in the ecosystem and the approach to making a prediction; and the spatial differentiation of hydrology and water resources and the counterpoint relationship of ecosystems.

The courses mainly include:

(1) 2 hours: Introduction to Ecohydrology
(2) 6 hours: The structure of ecosystem and hydrological components
(3) 4 hours: Theory of Hydrology and Modelling
(4) 4 hours: Theory of Ecohydrology and Modelling
(5) 4 hours: Low-impact development and source control
(6) 12 hours: Sponge city planning and design

Examination methods (open-book examination, closed-book examination or literature review, etc.)

Test criteria: Closed-book examination not required.

The score will be composed of the following parts:

1. Critical review: 15%
2. Term paper: 15%
3. Project report: 50%
4. Project presentation and defense presentation: 10%
5. Attendance: 10%

Teaching material Self-compiled teaching materials
Main bibliography and Literature Major references: *Ecohydrology: Vegetation Function, Water and Resource Management.* Written by Derek Eamus and Tom Hatton. Published by CSIRO Publishing
Other

Course name	大气环境化学	Course code	04022067
English name	Atmospheric chemistry		
Name of instructor	Jianfei Peng	Title of teacher	Professor
Class hours	32	Credits	2

Teaching methods (lecture or discussion and time arrangement of each class)

The course will be carried out by combining various teaching forms, including lectures, group discussion, and ppt responses. A group discussion session will be held during the last 10 minutes of each class. During the last 2 classes of the semester, students will give presentation on the atmospheric topics they are interested in.

Brief introduction of the main contents

Aiming at exploring the causes of the global atmospheric environment problems, this course will introduce the basic concepts and knowledge of atmospheric chemistry to the students. The contents will include the physical structure and chemical composition of the atmosphere, the source, form, transformation, and fate of key components in the atmosphere, and the environmental and climate impacts of these components. Meanwhile, this course will step-by-step explore the chemical mechanism of the globally concerned atmospheric environmental issues, such as the climate change and photochemical smog. This will guide students to in-depth thinking of their research in the future.

Examination methods (open-book examination, closed-book examination or literature review, etc.)

Classroom performance：20%
Project presentation and defense presentation：40%
Examination：40%

Teaching material

1、Seinfeld and Pandis, *Atmospheric Chemistry and Physics: from Air Pollution to Climate Change*, Wiley-Interscience Press, 2013

Main bibliography and Literature

1. Daniel J. Jacob, *Introduction to Atmospheric Chemistry*, Princeton University Press, 2004

2. 唐孝炎，大气环境化学，高教出版社，2006 3. 秦瑜，赵春生，大气化学基础，气象出版社，2003
Other

Course name	毒理化学	Course code	04022004
English name	Toxicological Chemistry		
Name of instructor	Yiming Yao	Title of teacher	Associate Professor
Class hours	32	Credits	2

Teaching methods (lecture or discussion and time arrangement of each class)

Teaching and discussion are combined with situational analysis and case discussion
The approximate ratio is: 28:1:1:2

Brief introduction of the main contents

This course takes chemical pollutants as the research object, takes the metabolism and detoxification process of environmental toxic substances as the main focus, systematically explains the toxicological concepts of metabolic enzymes, receptors, cell damage, chemical carcinogenesis, etc., and focuses on the correlation between chemical properties and toxic effects of substances, involving many fields such as molecular toxicology, environmental toxicology, toxicology research methods, environmental risk assessment, etc, It also integrates the latest research directions of new environmental pollutants and toxic effects. Students are required to master the latest research progress of molecular toxicology in the field of international environmental science, especially the latest research results, research methods and research system of new technologies and methods in chemistry, molecular toxicology, and molecular biology.

Examination methods (open-book examination, closed-book examination or literature review, etc.)

Based on the mastery of learning ability, comprehensive analysis ability and application ability, the typical scientific and environmental problems contemporarily concerned at home and abroad were selected for comprehensive assessment.
Mainly to submit literature review and oral report.

Teaching material

1. Stanley E. Manahan，《Toxicological Chemistry and Biochemistry》, third edition, Lewis Publishers, 2003.
2. Helmut Greim & Robert Snyder，《Toxicology and Risk Assessment: A Comprehensive Introduction》, John Wiley & Sons Ltd, 2008.
Ernest Hodgson ，《A Textbook of Modern Toxicology》，third edition, Wiley-interscience publication, 2004.

Main bibliography and Literature
1. Chemical Research in Toxicology (Journal)
2. Environmental Toxicology & Chemistry (Journal)
3. Environmental Health Perspectives (Journal)

其它

Course name	可再生与可持续能源利用	Course code	04022066
English name	Renewable and sustainable energy utilization		
Name of instructor	Bing Wang Lina Liu	Title of teacher	Associate Professor
Class hours	16	Credits	1
Teaching methods (lecture or discussion and time arrangement of each class) 1）Combined with practical cases, the current situation of renewable and sustainable energy utilization is introduced. 10 class hours 2）Ensure free discussion time between students and teachers in class. 6 class hours			
Brief introduction of the main contents This course will be a non-professional course suitable for all students, focusing on the close relationship between energy and environment, awareness of the current severe environmental pollution problems and energy crisis, and understanding some basic principles and knowledge of new energy.			
Examination methods (open-book examination, closed-book examination or literature review, etc.) 1．出勤 Attendance：30% 2．报告 Report：70%			
Teaching material 吴治坚,《新能源和可再生能源的利用》, 机械工业出版社,2006			
Main bibliography and Literature Maisie Walter,《Renewable Energy：Power for a Sustainable Future》,2017。			
Other			

Course name	应用数学基础	Course code	04022068
English name	Applied Numerical Analysis		
Name of instructor	Suiliang Huang	Title of teacher	Professor
Class hours	32	Credits	2
Teaching methods (lecture or discussion and time arrangement of each class) Courses 30 hours，Examination 2hours			
Brief introduction of the main contents After briefly reviewing relevant contents of higher mathematics, linear algebra and matrixes, this course presents four contents, which are most important for further studies and in practical application. 1 Solutions of Equations in One Variable（Order of Convergence；The Bisection Method；Fixed-Point Iteration；Newton’s Method；The Secant Method；Aitken’s Method；Steffensen’s Method；Extension of Newton’s			

Method）；2 Methods for Linear Systems （Introduction；Iterative methods（Jacobi, Seidel， Gauss-Seidel）；Direct methods（Gauss elimination, LU decompostion）；sensitivity and error analysis ）；3 Interpolation and Polynomial Approximation （Introduction；Interpolation and the Lagrange Polynomial；Data Approximation and Neville's Method；Divided Differences；Hermite Interpolation；Cubic Spline Interpolation）；4 Numerical Solutions to Partial Differential Equations（Introduction；Elliptic Partial Differential Equations；Parabolic Partial Differential Equations；Hyperbolic Partial Differential Equations）
Examination methods (open-book examination, closed-book examination or literature review, etc.) Closed-book examination Paper
Teaching material 1、J. Douglas Faires，Numerical Analysis，10th Edition， 2016 2、Jeffery J. Leader (清华大学影印版)， Numerical Analysis and Scientific Computation, 2008
Main bibliography and Literature 1、C.G. Koutitas, Pentech, Elements of Computational Hydraulics, Distributed in the USA by Chapman and Hall, 1983. 2、Romuald Szymkiewicz, Suiliang Huang, Adam SZYMKIEWICZ， Introduction to Computational Engineering Hydraulics, Gdansk University of Technology Publishing House, 2016. ISBN 978-83-7348-672-0.
Other