MODULE DESCRIPTION

Common Block

Module 1
1. Introduction to Chinese Culture (700K0002)
Lecture course + Group Presentation; 1CP; 2 hpw; autumn term;
Lecturers
Description
Dos and Don’ts; Chinese Cuisine; Chinese Languages; Chinese Dynasties and Historical Events; Great Thinkers and Philosophers; New China and Influencing Figures; Chinese Festivals; Chinese Education; Chinese Religion; Chinese Customs; Chinese Literature and Art; Chinese Medicine and Massage, Qigong.
Aim
To provide students with the basic knowledge on the above-mentioned aspects of Chinese culture.
Assessment
Essays and oral presentations.
Literature
A Passage to China, Ning Aihua, Li Zhonghua et al, China Ocean University Press

2. Chinese Language (700K0001)
Lecture course; 36 hrs; autumn term and spring term
Lecturers
Ms. Song Chen
Description
Introduction to Chinese Language;
Practical, easy-to-command phrases and commonly used vocabulary are introduced;
Lesson 1-10 teaches Pinyin, to help new learners with tones and rules for pronunciation;
Focus on the communication function.
Aim
Students can master 800-900 Chinese words and phrases, learn basic grammars and daily communication after fulfillment of elementary Chinese learning task.
Assessment
Written Exam and oral presentations.
Literature

Module 2
3. Physical Oceanography (700K0016)
Lecture + Seminar; 3 CP; 4 hpw; autumn term
Lecturers
Description
Introduction to physical property of seawater, distribution of water characteristics in
the oceans, heat and salt budgets, large-scale circulation and water masses,
measurement, coastal oceanography and air-sea interaction.

Aim
To introduce physical processes and underlying basic principles in the ocean

Assessment
Written test

Literature
Descriptive physical oceanography: An introduction, Groege L. Pickard, William J. Emery
And Lecture Notes

4. Marine Chemistry (700K0014)
Lecture course; 3 CP; 3 hpw; autumn semester

Lecturers
Prof. Dr. YANG Guipeng

Description
This course is the basic course of marine chemistry. It focuses on basic chemical
reaction and process in ocean. The content includes: 1) descriptive chemical
oceanography, 2) composition of the major components of seawater, 3) minor
components of seawater, 4) ionic interaction in seawater, 5) atmospheric chemistry, 6)
dissolved gases other than CO2, 7) the carbonate system in seawater, 8)
micronutrients in the oceans, 9) primary production in the oceans, 10) organic matter
in seawater.

Aim
Students will become familiar with the basic concepts of marine chemistry.

Assessment
Written Exam and oral presentations.

Literature

5. Marine Biology and Fisheries (Fisheries) (700K0018)

Lecture course + practical; 3 hpw; 3 CP; autumn term

Lecturers
Prof. GONG Xiangzhong
Prof. Dr. CHI Zhenming
Prof. LIU Qun

Description
This course deals mainly with marine microorganisms, marine micro- and macro-
algae, and the major taxonomical groups in invertebrates and vertebrates. The
biology, morphology, anatomy, the life cycle of representative species of each
kingdom, the ecology and the systematic biology will be introduced. The potential the
actual use in aquaculture of some economically important species will also be provided.

Fishing methods; Biocomplexity and fisheries sustainability; Reinterpreting the fisheries crisis; Surplus production models; Virtual population models.

Aim
Provide general concepts in morphology, anatomy, reproductive biology of representative species of marine invertebrate and vertebrate animals, micro- and macro-algae and microorganisms.

Provide some concepts of sustainable fisheries and some fish stock assessment models.

Assessment
Written Exam and Practical Reports.

Literature

6. Marine Geology700K0003

Lecture course + Group Presentation; 3CP; 3 hpw; autumn term;

Lecturers
Prof. Dr. WANG Houjie
Dr. QIAO Lulu
Dr. BI Naishuang
Dr. XU Jishang
Dr. MA Yanyan

Description
Introduction to the concepts and history of Marine Geology; basic knowledge of plate tectonics and oceanic lithosphere to understand the nature and origin of the ocean floor; and submarine tectonics; structure and geological processes at continental shelves and margins; sediment dynamics in estuaries and delta sedimentary processes; and resources in the Marine Realm, etc. A field excursion on coastal zone observation at Shi Lao Ren Beach.

This module provides: 1) a broad outline of the geological evolution of the ocean basins; 2) an introduction to the concept of tectonics and structural geology for the reconstruction of the history of eastern Euro-Asian plate and west Pacific Ocean plate; 3) basic knowledge of geological processes at continental shelves and margins; 4) sediment dynamics in estuaries and delta sedimentary processes; and 5) sedimentary records and petroleum and mineral resources in Ocean.

Aim
Students will become familiar with the basic concepts and recent development of marine geology, build an idea on the spatial-temporal scales of geological evolution of the oceans, and understand the importance of marine geology to the society of human beings.

Assessment
Written test and filed work report
Literature

Module 3

7. Climate changes (700K0012)
Lecture course + seminar; 2 hpw; 2 CP; spring term;
Lecturers
Dr. WAN, Xiuquan
Dr. ZHENG, Xiaotong
Description
This comprehensive course concentrates on the phenomena and processes of climate change on global and regional scale of the geological and recent past. It will include but not limited to the methods of assessing climate and climate change; mechanisms, models, theories, impact and prediction of climate change.
Aim
Students will become familiar with the evidences of climate change from observations and related climate modeling results to further understand the impacts of human being on their environment.
Assessment
1) 20-30 min oral presentation with discussion
2) homeworks
Literature
1) Hartmann, D.L., 1994, Global physical climatology, academic press;
3) IPCC, 2001, Climate Change (SAR);
4) IPCC, 2007, Climate Change (AR4); ......

8. Geographical Information System and Remote Sensing (700K0006)
Lecture course + practical; 4 hours/week; 4 Credit Points; spring term
Lecturer
Prof. Ge Chen, Prof. Chaofang ZHAO, Prof. Lei Guan, Dr. Yanyan Liu
Description
GIS and Remote Sensing is a required course of geographical science and relevant
specialty. As an important technical means for earth data collection and processing, it has been widely applied to many fields such as oceanography, meteorology, topography and so on. The main contents of this course are:

1) The basic theory of GIS;
   Introduce the concept of GIS, spatial data model and map projection.

2) The realization of function
   - The collection and processing of spatial data;
   - The construction and conversion of vector and raster data structure;
   - Spatial analysis;
   - DEM;
   - Data mining.

3) The application technology;
   Introduce to distributed GIS, web GIS, the standards of GIS and digital earth.

4) Imaging theory of remote sensing;

5) The methods of image manipulation.
   - Pretreatment of image;
   - Intensification of image;
   - Classification of image.

6) The basic theory of ocean remote sensing
   - Introduction of ocean remote sensing
   - Fundamentals of Ocean Remote Sensing
   - Visible / Infrared Remote Sensing
   - Microwave Remote Sensing
   - Future Oceanographic Satellite Systems
   - Reference (internet resources etc)

Aim
By familiarizing students with the basic concepts, theory and method of GIS and RS, this course aims at enhancing students’ research ability in geographical science and technology.

Assessment
Written Exam and oral presentations.

Literature

9. Introduction to Environmental Science (700K0008)

Lecture + exercise; 2 CP; 2 hpw; spring term;

Lecturers
Prof. GAO Huiwang
Dr. LI Zhengyan
Dr. ZOU Li

Description
This course gives an introduction of diverse aspects of Environmental Science including chemical pollution, water resource management, wastewater treatment, environmental monitoring, biogeochemical processes, ecosystem based environmental management, environmental impact assessment, etc.. It provides basic concepts of ecosystem health, sustainable development, biodiversity conservation and human health risks. It also offers ideas of ecological consequences of and environmental management for persistent organic pollutants.

**Aims**

This course aims to provide basic knowledge of environmental problems and their count-measures. It also aims to give some understanding of ecosystem concepts and their application in environmental management.

**Assessment**

Classroom performance and practical reports

**Literature**


10. Law of Sea (700K0005)

Lecture course; 3 hours/week; 1 Credit Points; Autumn Term

Lecturer: Dr/Professor BAI jiayu

**Description**

The Law of Sea course provides a comprehensive analysis of the United Nations Convention on the Law of the Sea (UNCLOS) from law and policy perspectives. The course focuses mainly on following subjects:

- Evolution of the law of the sea leading to the conclusion of the UNCLOS;
- UNCLOS framework governing maritime zones, i.e. territorial sea, contiguous zone, exclusive economic zone, continental shelf, high seas and international deep seabed;
- Legal regime for conservation and management of marine living resources;
- Regime for marine scientific regime under the UNCLOS and state practice;
- General international framework for marine environmental protection and cooperative framework at global level and regional level;
- Issues and cases on maritime boundary delimitation;
- Practical aspects and emerging issues of jurisdictional rights of coastal states; and
- Dispute settlement regime of the UNCLOS.

**Aim**

To provide the students with the fundamentals of international regime on the law of sea and state practice of this respect, and to guide the students the way of preliminary analysis of legal issues.

**Assessment**

Written Exam and oral presentations
Literature

Major Block

Major Module 1 Physical and Environmental Oceanography

- **Introduction to Marine Biogeochemistry (700K0020)**
  Lecture + report; 3 CP; 4 hpw; spring term;
  Lecturers
  Dr. ZOU Li
  Description
  To introduce to the salinity tracer and Re-doxy condition in the oceanic environment as well as boundary processes between the air-sea, river-sea and sediment-sea. The biogeochemical cycling of nitrogen and iron in the ocean. Introduction to JGOFS, new production and lipid biomarkers. Basic concepts on isotope chemistry and the application in marine environment
  Aim
  This course provides the basic knowledge on physical and Redox chemistry of seawater, the chemistry of marine sediments, and application of isotope methods in the ocean. Introduce the composition, distribution, transportation and transformation of bio-elements in the ocean. Refer to the source, production, transportation, transformation and preservation of organic matter associating on the marine organisms. Explore the relationship and feedback of behavior of elements and compounds to the marine organisms.
  Assessment
  Written test (50%) + reports (30%) + activity in class (20%)
  Literature

- **Ocean General Circulation (700K0009)**
  Lectures+seminar; 2 hpw; 2 CP; spring term
  Lecturers
  Prof. Lin Xiaopei

Aim
To provide the knowledge of the ocean circulation and understanding basic dynamics of ocean circulation.

Assessment
Written test

Literature
Regional Oceanography (Tomczak & Godfrey); Geophysical Fluid Dynamics (Pedlosky); Ocean Circulation Theory (Pedlosky); Atmosphere-Ocean Dynamics (Adrian E. Gill)

Waves in the Ocean (700K0021)
Lecture + seminar; 2CP; 2hpw; spring term;
Lecturers
Prof. GUAN Changlong

Description
General properties of waves; surface gravity, capillary, inertia-gravity, internal, Kelvin, Rossby, Poincare waves; Laplace tidal equations and the vertical structure equation; Equatorial beta-plane and equatorial waves; Stratified quasi-geophysical motion and instability waves; Wave-mean flow interaction.

Aim
To understand properties, behavior of waves that occur in the ocean, and how to include them in the overall picture of the ocean.

Assessment
Written test

Literature

Analytical Chemistry of Seawater (700K0017)
Lecture + seminar; 2 CP; 2 hpw; spring term;
Lecturers
Dr. LI Tie

Description
The course includes the brief introduction and the sampling and pretreatment methods, and the determination of normal parameters of marine chemistry, such as salinity, chlorinity, dissolved oxygen, pH, total alkalinity, CO₂ system and nutrients, dissolved and particulate organic carbon and some parameters of pollutant such as COD and trace metal as well. Purification of water and reagents, clean room technique, instrumental technology, data processing and analysis, and quality control are also involved.

Aim
This course provides the basic knowledge of Analysis of Seawater

Assessment
Major Module 2 Marine Biology

- **Marine Microbiology (700K0010)**
  - Lecture course + lab practical + seminars; 3 CP; 3 hpw; autumn term;
  - **Lecturers**
    - Prof. ZHANG Xiaohua
    - Dr. QI Zizhong
  - **Description**
    - Introduction to Marine Microbiology; Microbes in the marine environments; Integrated Ocean Drilling Program (IODP) expedition and subseafloor microorganisms; Viable but nonculturable (VBNC) state of marine bacteria; Microbial fish diseases and their control; Probiotics in aquaculture; Quorum sensing in marine bacteria; The role of microbes in ocean process; Introductory of marine microbiology works in OUC
  - **Aim**
    - This course deals mainly with ecology of marine microorganisms, potential uses of marine microorganisms in maricultural industry and other fields, and methods in molecular marine bacteriology
  - **Assessment**
    - Written Exam and oral presentations.
  - **Literature**
    - C. B. MUNN, Marine Microbiology; Ecology & Applications (Advanced Texts S.), 2003

- **Marine Ecology and Benthic ecosystem (700K0011)**
  - Lecture course + field practical + paper view; 3 CP; 3hpw; spring term;
  - **Lecturers**
    - Dr. ZHOU Hong
  - **Description**
    - Introduce concepts in marine ecology, general understanding of the characteristics of marine ecosystem; adaptations to the marine environment; population dynamics and species interaction; marine biotic diversity and community structure; patterns and processes in marine ecosystem; the characteristics of sea floor, interactions between the floor and the water layers; function of organisms in maintenance of the marine benthic ecosystem; energy flow and nutrient cycle in marine ecosystem.
  - **Aim**
    - Familiar with concepts and methods in marine ecology through their application to various benthic marine ecosystems.
  - **Assessment**
    - Written Exam and oral presentations.
Molecular Biology (700K0015)
Lecture course + paper view and/or seminars; 3 CP; 3 hpw; spring term
Lecturer
Prof. Dr. YANG Guanpin

Description
Molecular biological knowledge and methods are included in this course. The course is designed for the students who study for the master degree in biology. The main contents are (1) the history and new advancements of DNA sequencing techniques; (2) the development and application of diverse molecular marker systems; and (3) the methods of DNA cloning and gene expression. The contents include also (4) a brief introduction of methods applicable in ecological researches such as DNA barcoding for species identification; DNA extraction from environmental and conserved samples, cloning of gene indicators, DNA sequence based diversity description, microsatellite DNA marker based description of community structure, transcriptomic analysis of toxin exposed samples, and DNA methylation based biomarkers for environmental use.

Aim
Ability to use molecular biological methods to study biological and some ecological problems

Assessment
Written Exam

Literature
Historical key papers in concept and method development of molecular biology and closely related papers in method development and application newly published in last 5-10 years.