

## **Master's Program for International Students in EARTH SCIENCES**

### **Introduction**

The master's program in Earth Sciences is a multidisciplinary graduate program offered by the College of Science. It allows students to broaden their science background with courses from geography, geology, biology and meteorology. Most components have applied components to get students involved in field research within the confines of the individual course, and to address some of the most challenging interdisciplinary questions about the past, present and future state of the earth system.

### **Mission Statement**

- ◆ Educate students to become earth sciences researchers
- ◆ Promote students to conduct special research topics in earth sciences
- ◆ Promote students to apply professional research techniques in earth sciences

### **Admission**

Applicants generally have broad preparation in the social and/or physical sciences. The minimum requirement for admission to the Master of Science (M.S.) program is a Bachelor's Degree or its equivalent. A minimum of a 3.0 grade-point average (on a 4-point scale) is required. The admission process reviews the application in its entirety, including transcripts, statement of objectives for career goals and specific reasons for interest in Chinese Culture University, and looks for strong letters of recommendation from individuals who are familiar with the applicant's academic preparation and scholarly potential.

### **Program Structure**

The M.S. degree in Earth Sciences is a two-year program with thesis. Students are required to complete a minimum of 30 graduate credits in earth sciences and related courses. These courses have to be approved by the Graduate Affairs and Research Committee. Students must also maintain a minimum grade point average of 3.0.

The thesis must demonstrate the student's ability to formulate a research problem, to assemble and analyze relevant data, to draw appropriate conclusions, and to express findings clearly and concisely. It should be of publishable quality as judged by the advisory committee.

### Required Courses

Courses	Unit	Courses Description
Research Methodology & Thesis Writing	2 credits	The aim of this course is to let students understand the basic technique and concepts in geography. It includes two main parts: (1) to explain simply the main concepts and methodologies pertaining to Geography , and (2) to introduce the technique of writing dissertation, including the finding of topics, data collection, and the formulation of dissertation.
Seminar	2credits	The content of this course begins with the introduction of research topic and framework, followed by data acquisition and analysis, and the final report writing techniques.

### Elective Courses

Courses	Unit	Courses Description
English Presentation of Earth Sciences	2 credits	The main objective of this course is to study the effective methods and techniques to prepare all the key elements of a scientific manuscript. This includes title selection, introduction, literature review, materials and methods, results and discussions, conclusions, references, abstract and keywords.
Application of GIS	2 credits	The objective of this course is to present the advanced students with an overview of methods, techniques, systems and applications in Geographic Information Systems. The course is designed to give the students a better understanding of geo-database design and introduce advanced ArcGIS 9 system.
Land use Changes Analysis and Assessment	2 credits	The course will focus on a literature review of the processes of formulating methodology and developing and enhancing associated models.
Map Analysis and Application	2 credits	Based on basic concepts of cartography, this course emphasizes how to obtain, analyze and explain information used in theses and dissertations.

<b>Recent Trends in Cultural Geography</b>	<b>2 credits</b>	<p>Aimed at the development and significance of basic geographical concepts and theories that inform geographical thinking and the geographical imagination.</p>
<b>Topic on Environmental Geology</b>	<b>2 credits</b>	<p>Application of geological principles to the solution of environmental problems. The contents of this course include topics of earth materials and processes, soil and environment, natural hazards and overview, river and flooding, landslides and related phenomena, earthquakes and related phenomena, volcanic activity, coastal hazards, water pollution and treatment, waste management, mineral, energy resources and environments, air pollution, global change, and landscape evaluation and land use etc.</p>
<b>Digital Terrain Model Analysis and Application</b>	<b>2credits</b>	<p>This course focuses on using Digital Terrain Model (DTM) to digitally display the 3D spatial terrain variations. The course will introduce the basis of DTM, model analysis, and applications in topology and environmental management. Students will be trained and be familiar with the basic principles and application methodology of DTM, as well as developing independent research ability.</p>
<b>Ecology and Environment</b>	<b>2 credits</b>	<p>This course introduces the principles of ecology and its relevance to individuals, populations, communities, and ecosystems. It also examines the interactions of these levels with the environment.</p>
<b>Biodiversity and Conservation</b>	<b>2 credits</b>	<p>This course provides a biological perspective on current environment issues by exploring the origin, evolution, value of biological diversity and its extinction and depletion caused by overexploitation, habitat loss, pollution and invasive species. Conservation through habitat preservation, restoration and captive breeding will be discussed.</p>
<b>Ecological Impact Assessment</b>	<b>2 credits</b>	<p>The world's ecosystems are increasingly threatened by human development. In this course, we introduce the methods used to predict and evaluate the impacts of development on ecosystems and their components.</p>

<b>Basin Analysis</b>	<b>2 credits</b>	Basin analysis is an integrated study of sedimentary basins as geodynamic entities. The geodynamic system involving basin development must also include the processes of rock exhumation, erosion and sediment transport in the source terrains of sedimentary basins.
<b>Advanced Dynamic Meteorology</b>	<b>3 credits</b>	This course studies the governing equations of atmospheric waves and the associated physical mechanisms. A particular focus is put on the roles played by compressibility, density stratification, rotation, advection, barotropic and baroclinic effects, etc.
<b>Advanced Radar Meteorology</b>	<b>2 credits</b>	Weather radar is a very important observational instrument. The purpose of this course is to provide the basic radar theory and application for atmospheric students.
<b>Special Topics in Orographic Precipitation</b>	<b>2 credits</b>	The objective of this course is to introduce various mechanisms of orographic precipitation and to discuss issues described in recent published journal articles.
<b>Hydrogeology</b>	<b>2 credits</b>	In this course students learn the basics of hydrogeology including the fundamentals of the water cycle and water balance, the physics of flow and contaminant transport through porous media, aquifer hydraulic properties, and aquifer structure and heterogeneity, groundwater geochemistry and contaminated land issues.

## Faculty

Professor	Position	Degree
Dr. Yi-Chung Hsueh	Professor	Ph.D., University of Manitoba
Dr. Kwong-Fai Andrew Lo	Professor	Ph.D., University of Hawaii
Dr. Tsai-Ming Lee	Professor	Ph.D., State University of New York, Syracuse
Dr. Jia-Yuh Yu	Professor	Ph.D., University of California,

		Los Angeles
Dr. Cheng-Ku Yu	Professor	Ph.D., National Taiwan University
Dr. Mu-Chin Fu	Professor	Ph.D., London University, Botany
Dr. Ching-Hwang Liu	Associate Professor	Ph.D., University of California, Los Angeles
Dr. Yea-Chung Ding	Associate Professor	Ph.D., University of Washington
Dr. Ching-Jen Kao	Associate Professor	Ph.D., Chinese Culture University
Dr. Chi-Sheng Wei	Associate Professor	M.Sc., University of Missouri
Dr. Leh-Chyun Wu	Associate Professor	Ph.D., National Taiwan University
Dr. Chien-Hsiung Chao	Assistant Professor	Ph.D., National Taiwan University
Dr. Rou-Fei Chen	Assistant Professor	Ph.D., University of Pierre and Marie CURIE
Dr. Yi-Huey Chen	Assistant Professor	Ph.D., National Taiwan University
Dr. Ching-Huei Kuo	Assistant Professor	Ph.D., Boston University

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