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國立東華大學

課　　綱　Course Outline

自然資源與環境學系碩士班一般組

中文課程名稱 Course Name in Chinese	光性岩象分析				
英文課程名稱 Course Name in English	Optical Petrography				
科目代碼 Course Code	NRES51400	班 別 Degree	碩士班 Master’s		
修別 Type	選修 Elective	學分數 Credit(s)	3.0	時 數 Hour(s)	3.0
先修課程 Prerequisite					

課程目標
Course Objectives

本課程旨在介紹光性礦物學岩象分析的技術原理、實作與應用。光性岩象分析主要以偏光顯微鏡(polarizing microscope)及其週邊輔助具為主為儀器設備，為研究地質構造與礦物岩石科學的基礎工具，亦可應用在材料科學、環境地質與醫學藥學等應用領域上。期望學生於修習本課程後能利用此技術於論文研究或未來專業應用等方面。
This course aims to introduce the principles and applications of optical petrography. Students will learn how to use a polarizing microscope to identify minerals and rocks. This method is a traditional tool in geological sciences, but it can also be applied to other fields, such as materials science, archeology, environmental studies, forensic science, and medical sciences. Students will do some fun and meaningful projects
and gain hands-on experience.

系教育目標
Dept.’s Education Objectives

1	培養兼具國際視野與本土關懷的學生 To develop students who care about local issues and have an international perspective
2	培養具備自然科學與社會科學知識的人才 To educate students to have knowledge of both the natural and social sciences
3	培養具備環境倫理與人文素養的環境公民 To teach students to be environmental citizens (i.e., knowledgeable about environmental ethics and human issues)

系專業能力 Basic Learning Outcomes	課程目標與系專業能力相關性 Correlation between Course Objectives and Dept.’s Education Objectives

A	能覺知多元的自然科學與社會科學理論並具備研究能力 To have knowledge of natural and social science theories	●
B	具備自然資源與人類社會議題之調查分析、規劃與經營之能力 To be able to investigate, analyze, plan, and manage both natural resource and human social issues	●
C	具備將環境倫理與生態思想落實於永續性生活型態的能力 To implement sustainable lifestyles based on environmental ethics and ecological principle	○
D	能以整全式的觀點來解析環境問題，並具備發展系統性解決方案的能力 To resolve environmental issues and develop systematic solutions with a global perspective	○
E	具備系統分析、未來思考、溝通協調與團隊合作的能力 The ability to analyze, plan, communicate, and coordinate with others (teamwork)	○
F	具備終身學習、國際視野與外語溝通的能力 To instill the values of lifelong learning, an international perspective, and the ability to communicate in a foreign language	●

圖示說明Illustration ：● 高度相關 Highly correlated ○中度相關 Moderately correlated

課程大綱
Course Outline

本課程分教師講授與學生實作練習部分。後者將以熟悉使用偏光顯微鏡的操作與應用練習為主，授課的內容將包含下列主題: 礦物的光學性質與光性分類、礦物的光學鑒定、岩象的意義、重要性與可應用領域、偏光顯微鏡的原理介紹與操作、岩象微構造基本概念、種類、成因、火成岩礦物與岩象特徵介紹、變質岩礦物與岩象特徵介紹、沉積岩礦物與岩象特徵介紹、地質科學學術以外的岩象分析應用、光性薄片標本的準備與實作、文獻討論與專題實作。

This course contains two parts: lectures and practical exercises. The course content will include the following topics: optical properties and optical classification of minerals, optical identification of minerals, applications of petrography, introduction to the principles of polarizing microscopy, basic concepts of rock microstructures,
introduction to igneous/sedimentary/metamorphic minerals and rocks, and their petrographic characteristics, image processing and analysis, and preparation of rock thin-sections. This course can be tailored to students' needs and interests.

資源需求評估（師資專長之聘任、儀器設備的配合・・・等）
Resources Required (e.g. qualifications and expertise, instrument and equipment, etc.)

具備網路與電腦多媒體投影機的教室
偏光顯微鏡，CCD數位影像擷取系統

課程要求和教學方式之建議
Course Requirements and Suggested Teaching Methods

課堂講授、多媒體閱聽、期刊文獻閱讀、標本製作、儀器操作實作、研究專題

其他
Miscellaneous

參考書目

Vernon, R. H. (2004) A practical guide to rock microstructure, Cambridge University Press.
Passchier, C. W. and Trouw, R. A. J. (2005) Microtectonics (2nd Ed.), Springer