理 學 院
107學 年 度 第 一 學 期 模 組 化 課 程

結晶熱力學
Crystallization Thermodynamics

授課教師：

林俊孚
美國德州大學奧斯丁分校地球科學系

課程類別	學分數	選必修	開課人數	開課日期及上課時間	上課地點
講義+演習	1.5	選修	30	2018/08/06(一)-2018/08/10(五) 9:00-15:00	成功校區

先修課程或先備能力：

普通物理、普通化學、微積分

建議修課年級：

大二、大三、大四、碩士班

建議修課學生背景：

理學院、工學院、生科院、電資學院、醫學院

教學方法：

講授 60 %、報告/討論/測驗 40%

評量方式：

考試 Exams 80 %、作業 Homeworks 20 %、口頭報告 Presentation25%

補充說明：

Pop quizzes: Both in class and take home.

Exams: two in class exams; each one is for one hour; there will be both multiple choice and short answer questions; first exam will be given half way through the one-week schedule and second will be toward the end of the one-week schedule.

Homework: take home pop quizzes should be turned in next day before class starts;

Rating: Exams: 80% (each at 40%); pop quizzes and homeworks: 20%;

If you know you will miss an exam, you should inform Dr. Lin in the beginning of the course if possible. Documentation for why you will be missing that exam is required for consideration for your make-up exam. Lecture make-up exams is not normally agreed except under special circumstance

學習規範：

Please be considerate to your classmates during the lectures. Please turn off cell phones and pagers! If you bring a laptop to class, please sit where you will not disturb your neighbors--please turn off the speaker of your laptop.

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課程概述：

The goal of the course is to improve your understanding and appreciation of the physical, chemical, crystallographic and structural properties of minerals and crystals under thermodynamic variables. You will learn to identify a range of minerals and crystals including those that are abundant in rocks and in material applications. Minerals and crystals are the fundamental building blocks of planetary materials and have significant applications in material science. Mineralogy and crystallography combines elements of physics, chemistry, math, thermodynamics, and geology. Knowledge of mineralogy is the basis for the understanding of geological processes and material science application. Different minerals play crucial roles in a multitude of basic and applied sciences, including the material sciences, building construction, and applied industry, to name just a few. You will be exposed to some basic techniques for identifying minerals and crystals in hand sample and will also learn thermodynamic phase diagrams to identity mineral/crystal phases with variation in temperature and pressure.

The lecture schedule (see below) includes the reading assignments for each date and is intended as a guideline only: the lecture schedule is subject to change as needed. The lectures and reading assignments are designed to complement and reinforce each other. Anything presented in either the lectures or reading assignments is "fair game" on examinations. Attendance in class is require, and but you will likely do better on the exams if you come to classes and review sessions.

This syllabus represents the current plans and objectives of the course. As we go through the week, those plans may need to change to enhance the class learning opportunity. Such changes, communicated clearly, are not unusual and should be expected.

課程進度：

	時數(小時)	進 度 說 明
1	3 小時講課(上午) 討論、口頭報告 2 小時(下午)	Introduction to mineral and crystal physics and Crystal structures
2	3 小時講課(上午) 討論、口頭報告 2 小時(下午)	Crystallography I (symmetry elements: point groups)
3	3 小時講課(上午) 討論、口頭報告各 2 小時(下午)	Crystallography II (symmetry elements: space groups)
4	3 小時講課(上午) 討論、口頭報告各 2 小時(下午)	Phase diagrams and thermodynamics
5	3 小時講課(上午) 討論、口頭報告各 2 小時(下午)	Mineral and crystal physics

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課程學習目標：

The goal of the course is to improve your understanding of the physical, chemical, crystallographic and structural properties of crystals and minerals. You will learn to identify a range of crystals. Crystals are the fundamental building blocks of all earth materials, and consequently the Earth and other planets. Crystals combine elements of physics, chemistry, math, and material science. Knowledge of crystals is the basis for the understanding of material properties. This course will focus primarily on minerals and crystals in common rocks and materials.

課程的重要性、跨域性與時代性：

The importance is as shown in the Course Aims and Summary.

其他備註:

無