理学院
107学年度第一学期模组化课程

结晶熱力學
Crystallization Thermodynamics

授课教师：
林俊孚
美国德州奥斯丁大学地球科学系

<table>
<thead>
<tr>
<th>課程類別</th>
<th>學分數</th>
<th>選必修</th>
<th>開課人數</th>
<th>開課日期及上課時間</th>
<th>上課地點</th>
</tr>
</thead>
<tbody>
<tr>
<td>講義</td>
<td>1.5</td>
<td>選修</td>
<td>30</td>
<td>2018/08/13(一)-2018/08/17(五)9:00-15:00</td>
<td>待確認</td>
</tr>
</tbody>
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先修课程或先备能力：
普通物理、普通化学、微积分

建议修课年级：
大二、大三、大四、硕士班

建议修课学生背景：
理学院、工学院、生科院、电资学院、医学院

教学方法：
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 Presentation 25%

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.
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.

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<tr>
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<th>時數(小時)</th>
<th>進度說明</th>
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</thead>
<tbody>
<tr>
<td>1</td>
<td>3 小時講課(上午) 討論、口頭報告 2 小時(下午)</td>
<td>Introduction to mineral and crystal physics and Crystal structures</td>
</tr>
<tr>
<td>2</td>
<td>3 小時講課(上午) 討論、口頭報告 2 小時(下午)</td>
<td>Crystallography I (symmetry elements: point groups)</td>
</tr>
<tr>
<td>3</td>
<td>3 小時講課(上午) 討論、口頭報告各 2 小時(下午)</td>
<td>Crystallography II (symmetry elements: space groups)</td>
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<tr>
<td>4</td>
<td>3 小時講課(上午) 討論、口頭報告各 2 小時(下午)</td>
<td>Phase diagrams and thermodynamics</td>
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<tr>
<td>5</td>
<td>3 小時講課(上午) 討論、口頭報告各 2 小時(下午)</td>
<td>Mineral and crystal physics</td>
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</table>
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.

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

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