

國立中正大學課程大綱
National Chung Cheng University
Course Syllabus

學年/學期(Academic Year / Semester)		115/1	
課程名稱 (Course name)	Stable Isotope Geochemistry		
課碼 (Course code)	2708007	學分數 Credit(s)	3
授課教師(Instructor)	Hung-Chun Chao Email: ekman60@gmail.com Tel: +886-5-2729339		
	☐ Professor ☐ Associate Professor ☒ Assistant Professor		
授課方式 (Teaching Methods)	☐ Lab ☐ Seminar ☒ Student Presentation ☒ Lecture ☐ Other		
先修科目 (Prerequisite)	This course is intended for graduate students in Environmental Engineering, Chemistry, Soil and Water Sciences, Geology, and Environmental Science. A strong background knowledge in chemistry or geology is suggested.		
課程介紹與教學目標 (Course Description and Objectives)	Course Description—(3 credits): Stable isotopes have applied to not only earth sciences but also environmental, medical, and nutrient studies. The course introduce the theory of stable isotopes and the latest applications on stable isotopes. Objectives: Students who successfully complete this course should have: a. An understanding of the theory of isotope fractionation. b. An understanding of the way to measure isotope ratios. c. An understanding of the implications of stable isotopes in many scientific field such as climate change, hydrosphere, biosphere, solid earth, and to be as tracers.		
教科書及參考書 (Textbooks and References)	“Stable Isotope Geochemistry” by Jochen Hoefs, 6th Edition, Springer “Principles of Stable Isotope Geochemistry” by Zachary Sharp, Prentice Hall		
學習評量與成績配分 (Assessment and Grade Scale)	Exam-1.....50% (Week-08) Oral Presentations.....50%		

課程要求 (Course Requirements)	
課程進度(Course Schedule)	
Week	Contents
PART-1:	Introduction of stable isotopes, theory, measurement, implication.
Week 01	Course overview
Week 02	Introduction of isotopes and nuclide chart
Week 03	Isotopes and radioactivity
Week 04	Example applications of engineered nanomaterials: Medical, Agricultural, Environmental, Industrial
Week 05	Theoretical and experimental principles for stable isotope application(I): characteristics of isotopes, isotope effect, isotop exchange, kinetic effect, diffusion
Week 06	Theoretical and experimental principles for stable isotope application(I): characteristics of isotopes, isotope effect, isotop exchange, kinetic effect, diffusion
Week 07	How to measure the isotope ratio precisely
Week 08	Mid-term Exam
PART-2:	Case study of individual stable isotopes and oral presentations
Week 09	Water isotopes (H and O): preparation, analytical technique, fractionation and applications (I)
Week 10	Water isotopes (H and O): preparation, analytical technique, fractionation and applications (II)
Week 11	Carbon: preparation, analytical technique, fractionation and applications
Week 12	Carbonate isotopes (C and O): preparation, analytical technique, fractionation and applications
Week 13	Lithium: preparation, analytical technique, fractionation and applications
Week 14	Boron: preparation, analytical technique, fractionation and applications
Week 15	Sulfur: preparation, analytical technique, fractionation and applications
Week 16	Strontium: preparation, analytical technique, fractionation and applications
Week 17	Lead: preparation, analytical technique, fractionation and applications
Week 18	Other isotopes: preparation, analytical technique, fractionation and applications