Module code	SG-4310			
Module Title	Isotope Geochemistry and Geochronology			
Degree/Diploma	Bachelor of Science (Geology)			
Type of Module	Major Option			
Modular Credits	4	**Total student Workload**	10	hours/week
		Contact hours	4	hours/week
Prerequisite	None			
Anti-requisite	None			

Aims

The module provides a general overview about the basic concepts and the various applications of isotope geochemistry in natural systems. Introductions of the most important radioactive decay systems and the theory of stable isotope fractionation will be further discussed with many practical examples within Earth and Environmental Sciences. The module focuses on geochronology and the utility of light elements and their isotopes in low-temperature environments that allow obtaining a wider insight about different applications that can be useful in their future career.

Learning Outcomes

On successful completion of this module, a student will be expected to be able to:

Lower order :	30%	- understand the basic principles of relative and absolute dating - understand the essentials of radiogenic and stable isotope systems - familiarise themselves with the basic geological applications of isotopes
Middle order :	50%	- apply isotope geochemistry for basic Earth Science related subjects - interpret independently the results of isotopic analyses - apply isotopic methods of chronology and provenance - define problems on the application of isotopic techniques
Higher order:	20%	- calculate radiometric dates of geological formations - work alone or in collaborative teams based on the gained skills

Module Contents

- Origin of the elements, introduction to nucleosynthesis
- Radioactive decay and radiogenic growth; stable isotope theory and isotope fractionations
- Radiometric and other datingsystems and examples
- Isotopes of light elements (e.g., HCNOS)
- Water cycle, marine isotope chemistry, carbon cycle
- Applications to Stratigraphy, Palaeontology, Palaeoclimatology and Archaeology

Assessment	Formative assessment	Practical tests, assignments and feedback
	Summative assessment	Examination: 50%
		Coursework: 50% - 1 essay (25%) - 1 practical test (25%)