

<b>Module code</b>	SG-4312		
<b>Module Title</b>	Igneous and Metamorphic Petrogenesis		
<b>Degree/Diploma</b>	Bachelor of Science (Geology)		
<b>Type of Module</b>	Major Option		
<b>Modular Credits</b>	4	<b>Total student Workload</b>	10 hours/week
		<b>Contact hours</b>	6 hours/week
<b>Prerequisite</b>	None		
<b>Anti-requisite</b>	SG-4304 Igneous Petrogenesis, SG-4309 Metamorphic Petrogenesis		
<b>Aims</b>			
<p>This module aims to provide students with advanced information on the petrogenetic issues occurring in the Earth's interior. Evolution of Earth is described with the aid of thermodynamic laws and from the petrological viewpoint. Details for the processes occurring at various, present-day and past magmatic and metamorphic environments are presented, too.</p>			
<b>Learning Outcomes</b>			
<i>On successful completion of this module, a student will be expected to be able to:</i>			
Lower order :	30%	<ul style="list-style-type: none"> <li>- describe the formation of our Solar System and Earth's interior processes</li> <li>- report and understand the thermodynamic laws in petrogenesis</li> </ul>	
Middle order :	50%	<ul style="list-style-type: none"> <li>- define and research petrogenetic processes on Earth and other Planets</li> <li>- explain the evolution of Earth in certain regions and geological times</li> <li>- organise information from scientific papers and to analyse their data</li> <li>- investigate magmatic and metamorphic petrogenetic reactions</li> </ul>	
Higher order:	20%	<ul style="list-style-type: none"> <li>- calculate temperatures and pressures of formation of rocks</li> <li>- apply thermodynamic laws on magmatic and metamorphic systems</li> <li>- read and comprehend relevant, professional publications</li> </ul>	
<b>Module Contents</b>			
<ul style="list-style-type: none"> <li>- Origin of elements and minerals on the Earth</li> <li>- Fundamentals of thermodynamics; the role of the Earth's Mantle as a heat engine</li> <li>- The phase lever rules in the igneous and metamorphic systems; unary, binary, ternary systems</li> <li>- Processes for production and evolution of a magma and models of magmatic evolution</li> <li>- Factors of metamorphism, metamorphic zones, isograds and facies</li> <li>- Plot of assemblages on petrogenetic grids (AFM, ACF plots) and study of reactions</li> </ul>			
<b>Assessment</b>	Formative assessment	Practical tests, assignments and feedback	
	Summative assessment	Examination: 50% Coursework: 50% <ul style="list-style-type: none"> <li>- 1 class test (15%)</li> <li>- 1 group project with presentation (10%)</li> <li>- 1 practical examination (25%)</li> </ul>	