

<b>Module code</b>	SB-4317		
<b>Module Title</b>	Climate Change Biology		
<b>Degree/Diploma</b>	Bachelor of Science (Biology)		
<b>Type of Module</b>	Major Option		
<b>Modular Credits</b>	4	<b>Total student workload</b>	8 hours/week
		<b>Contact hours</b>	6 hours/week
<b>Prerequisite</b>	SB-2206 Principles of Animal Physiology		
<b>Anti-requisite</b>	None		
<b>Aims</b>			
This module will provide students with an understanding of the theory around how living organisms, species and communities are expected to respond to the climate change driven by anthropogenic elevation of atmospheric carbon dioxide.			
<b>Learning Outcomes:</b>			
<i>On successful completion of this module, a student will be expected to be able to:</i>			
Lower order :	20%	Describe historical climates and mechanisms for global climatic variation, global patterns of species distribution, and climate change Explain thermal variation within an organism's habitat Describe factors affecting variation in body temperature of an ectothermic animal, explain basic heat budget models Explain the significance of thermal limits, thermal tolerance and the thermal energetics of ectotherms under warming scenarios	
Middle order :	60%	Review morphological, behavioural and physiological thermoregulation of ectotherms; and buffering effects these offer under climate warming conditions Discuss the theory for optimality of thermal performance, and implication of this to thermal generalists-specialists; Discuss the foundations for climate vulnerability in terms of exposure, sensitivity and adaptation Review the consequences of elevated CO <sub>2</sub> levels on agricultural production and forest ecosystems, Discuss the basic principles of ocean acidification and its consequences to marine life	
Higher order:	20%	Measure, analyse and interpret spatial and temporal variation in the temperature of an ectotherm's habitat (eg. rocky shore snail) Conduct experiments to determine the physiological thermal performance and lethal temperature of an ectotherm and work independently in analysing data for measured physiological parameter, and for writing a report	
<b>Module Contents</b>			
<ul style="list-style-type: none"> <li>- Paleoclimate (historical climatic variation), Global climatic variation and seasonality</li> <li>- Body temperature and operative temperature , Introduction to temperature physiology</li> <li>- Principles of evolution and thermal adaptation, Optimal performance curves</li> <li>- Thermal resistance and thermal capacity, Morphological, behavioural and physiological thermoregulation in ectotherms, Thermoregulation in the context of climate warming</li> <li>- Climatic vulnerability in terms of a conceptual model for exposure, sensitivity and adaptation</li> <li>- Species and community responses to climate warming</li> <li>- Changing CO<sub>2</sub> levels, earth systems and society, Agricultural production and forest ecosystems</li> <li>- Impacts of and responses to climate warming, Ocean acidification</li> </ul>			
<b>Assessment</b>	Formative assessment	Tutorial assignments and feedback	
	Summative assessment	Examination: 50% Coursework: 50% - 3 practical reports (30%) - 1 oral presentation (10%) - 1 class test (10%)	