

<b>Module code</b>	SC-4328		
<b>Module Title</b>	Selected Topics in Advanced Spectroscopy		
<b>Degree/Diploma</b>	Bachelor of Science (Chemistry)		
<b>Type of Module</b>	Major Option		
<b>Modular Credits</b>	2	<b>Total student Workload</b>	4 hours/week
		<b>Contact hours</b>	2 hours/week
<b>Prerequisite</b>	None		
<b>Anti-requisite</b>	None		
<b>Aims</b>			
The aim of this module is to provide students with an understanding of modern advanced spectroscopy applied to unravelling structural information about a molecule and to understand modern spectroscopic microscopy.			
<b>Learning Outcomes</b>			
<i>On successful completion of this module, a student will be expected to be able to:</i>			
Lower order:	40%	<ul style="list-style-type: none"> <li>- understand the principles of an NMR spectrometer</li> <li>- understand a Fermion and a Boson particle and their nuclear spin.</li> <li>- understand spin multiplicity and J-coupling.</li> </ul>	
Middle order:	40%	<ul style="list-style-type: none"> <li>- describe the nuclear Overhauser effect and its application to structural determination in 1D-NMR</li> <li>- describe the basic principle of 2D-NMR based upon J-coupling and NOE.</li> <li>- describe stereochemistry of a molecule based upon a 2D NOESY spectrum.</li> </ul>	
Higher order:	20%	<ul style="list-style-type: none"> <li>- analyse the energy state diagram for the NOE experiment.</li> <li>- analyse a certain topic independently and collaboratively in a team.</li> </ul>	
<b>Module Contents</b>			
The main contents of the module are:			
<ul style="list-style-type: none"> <li>– Bosons Fermions and nuclear spin</li> <li>– 1-D NMR spectra and spectral splitting</li> <li>– The nuclear Overhauser effect</li> <li>– 2D-NMR, NOESY and COSY for a particle in a potential well, linking to electronic spectra.</li> <li>– Optics, lasers, and microscopy</li> </ul>			
<b>Assessment</b>	Formative assessment	Tutorial and feedback	
	Summative assessment	Examination: 60% Coursework: 40% <ul style="list-style-type: none"> <li>- 2 written assignments (20%)</li> <li>- 2 class test (20%)</li> </ul>	