

Title	Structure and Biophysical Studies of Nucleic Acids: Drug Binding and More		
Credits	2.5		
Semester	2 (Year 1)		
Level	4		
Coordinator	Dr. Susan Quinn		
Indicative Module Descriptor:			
<p>The module aims to give students a comprehensive understanding of nucleic acid structures. The introduction will explore the history of the DNA structure and development of synthetic methods for basic and advanced systems. Attention will focus on the use techniques such as X-ray crystallography and NMR in resolving nucleic acid structures. Based on the understanding of the structural properties the principles governing small molecule binding interactions such as intercalation, groove binding and anti-sense therapies will be studied. The characterisation of nucleic acid binding interactions will be thoroughly examined by considering a broad range of techniques including optical, hydrodynamic and calorimetry techniques. Finally, the processes involved in DNA damage will be studied. This will focus on oxidative and photochemical damage and the biological relevance.</p>			
Indicative Learning Outcomes			
<p>On successful completion of this module, students should:</p> <ul style="list-style-type: none"> • Have knowledge of the synthetic procedures used for the preparation of nucleic acids and their analogues. • Know the different nucleic acid structures and the molecular interactions governing them. Be familiar with structural transitions in nucleic acids. • Know the Physical Techniques for Characterization of nucleic acids in solution • Understand the principles governing binding interactions to nucleic acid structures and the characterisation of these interactions. • Be aware of processes involved in DNA damage (oxidative and photochemical) 			
Workload:	50		
Class Contact: Lectures	10		
Specified Assignments	20		
Autonomous Student learning	20		
Assessment	type	%	timing
Examination	Written exam (2hr)	50	End Yr 1
Assignments	Project	50	
<p>Students are required to:</p> <ol style="list-style-type: none"> 1. Prepare a short report on a particular nucleic acid system based on a literature study. (20) 2. Pass (60%) a written open book examination. (2hr) <p>Students will either pass or fail the module on basis of satisfactory or unsatisfactory completion of the assigned tasks.</p>			

