Astrobiology

Aims:

To develop an understanding of the physical processes that govern the formation and evolution of planets, planetary atmospheres and Life. To understand the possibilities and limitations of searches for extra-solar planets and extra-terrestrial Life, and of interstellar travel and communication. To appreciate the vulnerability of Life on Earth, and the processes by which humankind affects and is affected by the Earth's environment.

Intended Learning Outcomes:

Outcome	Mode of assessment
Understanding the physical processes that govern the formation and evolution of planets, planetary atmospheres and Life.	**Problemsheets, unseen examination and mini-project**
Understanding the possibilities and limitations of searches for extra-solar planets and extra-terrestrial Life.	**Problemsheets, unseen examination and mini-project**
Understanding the possibilities and limitations of interstellar travel and communication.	**Problemsheets and unseen examination**

Indicative content and activities:

The formation of the Solar system; formation of extra-solar planetary systems; the Habitable Zone; the physics of planetary atmospheres and the role of feedback mechanisms; the Solar-Earth interaction; organic astrochemistry; meteoritic evidence; the formation and evolution of Life on Earth; the Drake equation; techniques for the detection of extra-solar planets; the properties of known extra-solar planetary systems; techniques for the study of extra-solar planetary atmospheres; detection of signatures of Life; techniques of manned and unmanned space travel; techniques of interstellar communication.

Activities: lectures, directed-reading discussion sessions, and a mini-project involving the use of data collected with the Keele Observatory telescopes to perform a simple observational analysis of a planet, moon or star or of an astronomical event.

Assessment process

Number of assessments:	**2 problemsheets; 1 mini-project mini-seminar; 1 unseen examination**
Sequence no: ASSESSMENT DATA (required for each assessment for a module)	
Type of assessment	**Problemsheets**
Brief description of assessment	**4 problems per sheet, consisting of quantitative calculations on the lecture material**
Assessment weighting (%) for module(0 if formative assessment)	**10%**
Pass mark (if applicable)	**30%**
Sequence no: ASSESSMENT DATA (required for each assessment for a module)	
Type of assessment	**Mini-project mini-seminar**
Brief description of assessment	**Clarity of description and presentation, displayed evidence of observing skills, and quantitative interpretation of observations; includes benchmark assessment of the participation in the observations preparation, execution and analysis**
Assessment weighting (%) for module (0 if formative assessment)	**20%**
Pass mark (if applicable)	**30%**
Sequence no: ASSESSMENT DATA (required for each assessment for a module)	
Type of assessment	**End-of-semester examination**
Brief description of assessment	**Students answer 3 out of a choice of 5 questions, testing their knowledge and understanding of the lecture material and of topics from the discussion sessions**
Assessment weighting (%) for module (0 if formative assessment)	**70%**
Pass mark (if applicable)	**30%**