

MODULE DESCRIPTOR

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|-------------------------|---------------------------------|------------------|------|----------------------------|-----------------------|---|
| MODULE TITLE | Introduction to Astrobiology | | | | | |
| MODULE CODE | AA1059 (L4) | JACS CODE | F510 | CREDIT VALUE | 20 credits | |
| DATE OF APPROVAL | April 2017 | | | | VERSION NUMBER | 1 |
| SCHOOL | Physical Sciences and Computing | | | PARTNER INSTITUTION | N/A | |

RELATIONSHIP WITH OTHER MODULES

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|----------------------|------|-----------------------|------|------------------------------|------|
| Co-requisites | NONE | Pre-requisites | None | Excluded Combinations | None |
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MODULE AIMS

This module aims to:

- Provide an introduction to astrobiology, including basic chemistry and biology, suitable for people with little prior knowledge of the subject.
- Provide an understanding of scientific laws and concepts as applied to the universe and astrobiology
- Provide an introduction to aspects of observational or laboratory science
- Develop elementary problem solving skills
- Provide the opportunity to develop skills and techniques used in astrobiology (astrophysics, biology and chemistry), which have wider application (these include data analysis, preparation of scientific reports.
- Enhance the student's key skills (communication, numerical skills, IT, time-management).

MODULE CONTENT

Life on Earth: life sustaining environments, evolution, origins, range, limitations.

Chemistry/biochemistry. Fossil records.

Solar System Sites that might support life: Planets and Moons. Sites with the possibility of liquid water, complex chemistry and organic material. Comets.

Search for terrestrial planets: detection techniques, searching for planetary atmospheres and chemical composition. Space missions and ground-based surveys. Signatures of appropriate biochemistry.

Extraterrestrial biochemistry: Alternatives to carbon and oxygen, other probable processes, constraints of physics, biology and chemistry on possibilities

Space origins of life: panspermia, comets as a source of biological material, life on Mars

Human factors for space exploration: physiological and psychological impact of isolation, crowded or constrained living and working spaces and engaging in high risk activities

Environmental influences on life: radiation, gravity, temperature, pressure, atmospheric composition, extremophiles as examples of life in unexpected places.

INTENDED LEARNING OUTCOMES

On successful completion of this module a student will be able to:

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| 1. | Describe biochemical and physical processes that take place in the universe with relevance to astrobiology. |
| 2. | Describe a range of environments capable of supporting a wide range of life forms. |
| 3. | Conduct a scientific investigation and rigorously report on the outcomes. |
| 4. | Solve elementary problems and apply appropriate practical skills. |

ASSESSMENT METHODS

The method of assessment for this module has been designed to test all the learning outcomes. Students must demonstrate successful achievement of these learning outcomes to pass the module. *Only summative assessment should be included.*

| Number of Assessments | Form of Assessment | % weighting | Size of Assessment/Duration/ Wordcount | Category of assessment | Learning Outcomes being assessed |
|-----------------------|---------------------------------|-------------|--|------------------------|----------------------------------|
| 2 | Question/ Problem sheets | 25+35% | 6-8 questions | Coursework | 1,2,4 |
| 1 | Report on scientific experiment | 40% | 1600 words | Coursework | 3,4 |

MODULE PASS REQUIREMENTS

To pass this module you must achieve a mark of 40% or above, aggregated across all the assessments.

APPENDIX**MODULE CODE:** AA1059 (L4)**MODULE TITLE:** Introduction to Astrobiology**LOCATION OF STUDY:** *UCLAN CAMPUS*

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| MODULE TUTOR(S) | Dimitris Stamatellos |
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| MODULE DELIVERY | Semester Long | Semester 1 | | Semester 2 | | Semester 3 | |
| | Year long | Semester 1 & 2 | | ✓ | Semester 2 & 3 | | |
| | Other (please indicate pattern of delivery) | DISTANCE LEARNING | | | | | |

MODULE LEARNING PLAN

All modules should include details of the average learning time based upon 200 hours per 20 credits.

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| LEARNING, TEACHING AND ASSESSMENT STRATEGY | |
| <p>Distance learning students will learn via self-study, supported by detailed distance learning material supplied by the Course Team according to a Course Schedule. Tutorial support via online discussion forums, online classrooms email and telephone as required.</p> <p>The learning materials include Course Notes with worked examples, self-test exercises and assessed coursework. Additional material and suggested further reading will be available via Blackboard. Some of the activities contain questions to encourage students to solve conceptual and numerical problems and to build their confidence prior to attempting the assessed question sheets. The assessed question sheets are designed to enable students to demonstrate their understanding and ability to solve problems and explain the concepts involved.</p> <p>Other activities are designed to develop students' observational and laboratory skills such as designing a simple experiment, making observations, analysing data and developing their skills in writing a formal scientific report.</p> | |
| SCHEDULED LEARNING AND TEACHING ACTIVITY | <i>No. of hours</i> |
| Tutorial | 8 |
| TOTAL SCHEDULED LEARNING HOURS | 8 |
| GUIDED INDEPENDENT STUDY | |
| <p>First reading of posted materials (equiv. to lectures) <i>Working through details</i> <i>Background reading</i> <i>Working on coursework assignments</i> <i>Reflection on feedback</i></p> | |
| TOTAL GUIDED INDEPENDENT STUDY HOURS | 192 |
| TOTAL STUDENT LEARNING HOURS (<i>eg 200 hours per 20 credits</i>) | 200 |

BIBLIOGRAPHY AND LEARNING SUPPORT MATERIAL

On-line Booklist: <http://readinglists.central-lancashire.ac.uk/search.html?q=aa1059>

