

Module code

SPB-3402

Type of module

Undergraduate: Biological Sciences – Elective

Bioinspiration



Modular credits

4

Total student
engagement

56 hours

Prerequisite

SPB-1201 Diversity of
Life OR SPB-1202
Organisms and
Environment OR SPB-
1203 Skills in Biological
Sciences

Anti-requisite

None

Aims

To provide students with an understanding of how biologists and engineers find inspiration in nature and use it as a model to make technological innovations and solve societal problems.

Module learning outcomes (MLO)

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

MLO 1

Analyse how learning from nature can bring about innovation.

MLO 2

Analyse how we can take inspiration from biological systems and apply them to engineering and technological problems.

MLO 3

Connect the concepts and approaches in bioinspiration for the quantitative and qualitative analysis of biological function across different species and levels of organisation.

MLO 4

Enable the discovery of objective design methods for bioinspired technology that mimics biological function.

MLO 5

Analyse the selective pressures that have shaped organisms and how these insights can transform bioinspiration from an art/craft into a mature engineering discipline.

Module contents

Learning from nature, creativity, and innovation

Biological materials and nanostructures

Robotics, locomotion, and sensing the environment

Principles of aerodynamics and fluid dynamics

Energy and architecture

Bioinspiration and human health

The business of bioinspiration

How AI can speed up innovation

Assessment

50%

Examination

50%

Coursework

Examination
50%

20%

20%

10%

Examination — 50%

Written practical reports — 20%

Class tests — 20%

Written assignment — 10%

Formative assessment

Weekly tutorials and problem-based learning sessions for discussion and feedback

Summative assessment

COMPONENT	WEIGHTING
Examination	50%
Coursework	50%
Individual	50%
Written practical reports	20%
Class tests	20%
Written assignment	10%

Graduate attributes and skills

Programme learning objectives (PLO) addressed

1	PLO 1 (Fundamental Theoretical Knowledge in Biology)	2	PLO 2 (Application of Scientific Methods and Data Analysis)
3	PLO 3 (Integrated Laboratory, Field and Technical Skills)	4	PLO 4 (Critical Thinking and Problem-Solving Skills)
5	PLO 5 (Sustainability and Responsible Practice)		

Sustainability concept addressed

1	SDG 1 No Poverty
9	SDG 9 Industry, Innovation and Infrastructure
15	SDG 15 Life on Land

Digital skills/software used (not limited to)

- Microsoft Office software (e.g. Word, Excel, PowerPoint)
- Application software (e.g. Web browsers, statistical program, cloud-based storage and file sharing platform)
- eLearning platforms (e.g. CANVAS, Zoom)
- Ladybug Tools plugin for Rhino and Grasshopper

Micro-credentialling option

No

Stackable towards GenBESTARI Undergraduate Degree Programme or other relevant Lifelong Learning Programmes

No

Document details

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