Please note that the information displayed on this page may change prior to the commencement of year / session.

The information displayed on this page is for students commencing this course in the identified year only. Students follow the rules and requirements for the year that they commenced their course.

Graduate Certificate in Biofabrication

Testamur Title of Degree:	Graduate Certificate in Biofabrication
Abbreviation:	GCertBiofabrication
UOW Course Code:	2135
CRICOS Code:	N/A
Total Credit Points:	24
Duration:	12 months part-time only
Home Faculty:	Faculty of Science, Medicine and Health
Intake Session(s):	Spring
Delivery Mode:	Distance
Delivery Campus:	UOW Online

Overview

The Graduate Certificate in Biofabrication is a unique offering for students interested in new additive biofabrication methods for medical applications. If you want to take a lead role in next generation industries, like 3D printing body parts and regenerative medicine then this degree will be of interest to you.

The program includes advanced coursework in methods of biofabrication and their application to health and medicine. Fundamental topics and methodologies that will be covered include: printable materials and their properties; biopolymers and bio-inks; 3D printing techniques and instrumentation such as rapid prototypers, reactive printers, extrusion printers, metal printers, bioplotters and live cell printing; Students will gain experience in software design and CT image extraction in work-flow processes in biofabrication. Independently-driven activities will enable students to freely design and create 3D structures and objects and critically evaluate their potential for innovative technology, commercial and business opportunities.

Course Learning Outcomes

Course Learning Outcomes are statements of learning achievement that are expressed in terms of what the learner is expected to know, understand and be able to do upon completion of a course. Students graduating from this course will be able to demonstrate:

CLO	Description
1	Demonstrate and translate advanced knowledge of the development and use of biofabrication and additive manufacturing.
2	Apply advanced research, methods and technologies to solve problems derived from the science of biofabrication and additive manufacturing.
3	Communicate concepts in biofabrication and additive manufacturing effectively to diverse audiences using appropriate methods, technologies and research-based initiatives.
4	Identify, interpret and analyse stakeholder requirements within the context of biofabrication and additive manufacturing.
5	Apply appropriate ethical, public and personal behaviours within a range of contexts in learning and professional practice.
6	Demonstrate the ability to reflect on and ethically direct own learning and practices within the context of biofabrication and additive manufacturing.

Course Structure

To qualify for award of the degree, the Graduate Certificate in Biofabrication, a candidate must successfully complete at least 24 credit points, comprised of:

Subject Code	Subject Name	Credit Points
AIIM900	Introduction to Additive Biofabrication	12
AIIM901	Practical Learning and Training in Additive Biofabrication	12

Other Information

For further information please email: smah-students@uow.edu.au

Last reviewed: 9 November, 2018

Subject Descriptions - Subject Information

Calendars Subject Information

2019 Postgraduate Calendar

Faculty of Science, Medicine and Health
Science, Medicine and Health

SHOW ALL SUBJECT INFORMATION

SUBJECT INFORMATION

Subject Code
AIIM900

Subject Name
Introduction to Additive Biofabrication

Credit Points
12

Pre-Requisites
Nil

Co-Requisites
Nil

Restrictions
Nil

Equivalence
Nil

Assessment
Quizes/Exam (Monitor Progress in 3D Printing Concepts) 10%
Short-Essay (Bioethics) 20%
Tutorial (Software Design) 30%
Written Assignment (3D Printing Topic) 405

General Subject

No.

SUBJECT DESCRIPTION

The subject will introduce students to the emerging area of Additive Biofabrication, including the concepts that distinguish this approach from traditional manufacturing. Topics covered include: Fundamental topics and methodologies of additive fabrication; Printable materials and their properties; Biopolymers and bio-inks; Techniques/instrumentation such as commercial additive fabrication systems, rapid prototypers, reactive printers, extrusion printers, metal printers, coating techniques, bioplotters and live cell printing; Computer-aided design (CAD) solutions such as Solidworks™ or ProE™, through to free-form animation toolsets such as Autodesk 3ds Max™. Future applications, impacts and ethics in society will be discussed.

SUBJECT LEARNING OUTCOMES

On successful completion of this subject, students will be able to:
1. Translate advanced and specialised knowledge about recent developments in biomaterials, including biopolymers and bio-inks.
2. Demonstrate an understanding of the rheology of biopolymers and bio-inks, and formulate printable materials specific to an application area.
3. Appreciate how biomaterials, biopolymers and bio-inks are applied during the fabrication process.
4. Explain the operating principles of additive biofabrication techniques.
5. Design a workflow process to produce a 3D structure, prototype or device using additive biofabrication.
6. Exercise critical thinking and judgement in the generation and evaluation of innovative technology and related business ideas and solutions.
7. Evaluate the application of knowledge and skills associated with additive biofabrication techniques in professional practice and/or further learning;

Subject Descriptions - Subject Information

Calendars Subject Information

2019 Postgraduate Calendar

Faculty of Science, Medicine and Health Science, Medicine and Health

SHOW ALL SUBJECT INFORMATION

SUBJECT INFORMATION

Subject Code
AIIM901

Subject Name
Practical Learning and Training in Additive Biofabrication

Credit Points
12

Pre-Requisites
Nil

Co-Requisites
Nil

Restrictions
Nil

Equivalence
Nil

Assessment
Practical Activity Quiz (Printing Demo/Operation Principles) 10%
Practical Activity (Workflow Process: CT Image Extraction, Conversion and Print) 40%
Written Report (Research Proposal) 30
Presentation (Research Plan and Portfolio) 20

General Subject

No.

SUBJECT DESCRIPTION

The subject will provide hands-on practical training and research experience within the laboratories of the Australian Institute for Innovative Materials (AIIM). Major activities of the practicals will include: Developing and characterising biopolymer, bio-ink and printable formulations; Hands-on training and operation of various additive biofabrication instrumentation such as rapid prototypers, reactive printers, extrusion printers, metal printers, coating techniques, bioplotters and live cell printers. Participation in work-flow process, including design of software models and their integration through to printing 3D objects and post-production. Independently-driven projects will enable student to freely design and create 3D structures/objects and critically evaluate their potential for innovative technology, commercial and business opportunities.

SUBJECT LEARNING OUTCOMES

On successful completion of this subject, students will be able to:
1. analyse and evaluate the characterisation of biomaterials, biopolymers and bio-inks and the ensuing products during workflow processes;
2. explain the operating principles of additive biofabrication techniques;
3. implement a workflow process to produce a 3D structure, prototype or device using additive biofabrication;
4. demonstrate advanced technical skills in investigating, analysing and synthesising information, problems, concepts and theories;
5. exercise critical thinking and judgement in the generation and evaluation of innovative technology and related business ideas and solutions;
6. evaluate the application of knowledge and skills associated with additive biofabrication techniques in professional practice and/or further learning;
7. communicate advanced knowledge and the significance of outcomes resulting from the planning and execution of a substantial research-based initiative.