

# Biotechnology

# **Programme Information**

2022.01, Approved

### Overview

Programme Code	46432
Programme Title	Biotechnology
Awarding Institution	Liverpool John Moores University
Programme Type	Degree with Foundation

#### Awards

Award Type	Award Description	Award Learning Outcomes
Target Award	Bachelor of Science with Honours (Fnd) - BSHF	N/A
Alternative Exit	Certificate of Higher Education - CHE	Apply a broad knowledge base, incorporating theoretical concepts and employing a wide range of specialised skills to real and theoretical Biotechnology applications. Apply a broad knowledge base, incorporating theoretical concepts and employing a wide range of specialised skills to real and theoretical Biotechnology applications. Evaluate information using it to plan and develop investigative strategies and to determine solutions to a wide range of scientific problems. Evaluate information using it to plan and develop investigative strategies and to determine solutions to a wide range of scientific problems. Operate in a range of science contexts, and take responsibility for their contributions and outputs. Operate in a range of science contexts, and take responsibility for their contributions and outputs.
Alternative Exit	Diploma of Higher Education - DHE	Generate ideas through the analysis of concepts at an abstract level, with a command of highly specialised skills and the formulation of responses to concrete and abstract problems. Accept responsibility for group and personal work. Analyse and evaluate information, demonstrating significant judgement across a broad range of Biotechnology related areas.

Alternate	Award	Names

Partner Name	Partnership Type
Yunnan Agricultural University	Dual

## **External Benchmarks**

Subject Benchmark Statement

UG-Biosciences (2019)

# Programme Offering(s)

Mode of Study, Mode of Delivery	Intake Month	Teaching Institution	Programme Length Programme Length Unit
Full-Time, Face to Face	September	Yunnan Agricultural University	4 Years

## Aims and Outcomes

Educational Aims of the Programme	To provide for all students a defined academic programme of study with clear learning outcomes. To provide students with a wide knowledge and understanding of core subject matter to enable them to pursue a career in Biotechnology related employment. To enable students to acquire a high level of practical, analytical and research skills in biotechnology. To develop critical, analytical problem-based learning and transferable skills to prepare the student for graduate employment. To develop those learning, information technology, communication and reflective skills necessary to enable students for undertake independent study, and to participate in lifelong learning. To provide students from a wide variety of educational backgrounds with a high quality learning experience in a supportive environment. To provide opportunities for students to gain commercial awareness, develop entrepreneurial skills and explore a wide range of career options.
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### Learning Outcomes

Code	Number	Description
PLO1	1	Appreciate fundamental concepts, principles and theories relevant to biotechnology encompassing molecular, cellular and physiological processes, microbiology, biochemistry, synthetic biology and genetics.
PLO2	2	Apply subject knowledge and understanding to address familiar and unfamiliar problems.
PLO3	3	Recognise the moral and ethical issues of investigations and appreciate the need for ethical standards and professional codes of conduct.
PLO4	4	Demonstrate competence and progressive development in the basic and core experimental skills appropriate to the study of biotechnology.
PLO5	5	Design, plan, conduct and report on investigations which may involve primary or secondary data.
PLO6	6	Obtain, record, collate and analyse data using appropriate techniques working either individually or within a group.
PLO7	7	Comply with health and safety policies, Good Laboratory Practice (GLP), risk and Control of Substances Hazardous to Health (COSHH) assessments and recognise the importance of quality control and quality assurances.
PLO8	8	Use and interpret a variety of sources of information: textual, numerical, verbal and graphical within the laboratory setting.
PLO9	9	Understand the need when undertaking sample selection to ensure validity, accuracy, calibration, precision, reproducibility and the need to highlight uncertainty and potential sources of bias during data collection.
PLO10	10	Prepare, process, interpret and present data using appropriate qualitative and quantitative techniques, statistical programmes, spreadsheets, bioinformatics, and programmes for presenting data visually.

PLO11	11	Communicate scientific information effectively in written, verbal, and visual forms.
PLO12	12	Demonstrate competence in core experimental skills applicable to the biotechnology sector, including data analysis and interpretation of results with a critical understanding of the appropriate contexts for their use through the study of texts, original papers and reports.
PLO13	13	Use information technology to prepare, process and present information.
PLO14	14	Identify and work towards targets for personal, academic, professional and career development.
PLO15	15	Develop skills necessary for independent life-long learning (for example working independently, working as part of a team, time management, problem solving, organisational and enterprise skills).
PLO16	16	Engage with current developments in biotechnology and their applications, including the philosophical and ethical issues involved.
PLO17	17	Critically evaluate current research in the field of biotechnology.
PLO18	18	Analyse, synthesise and summarise information critically from a variety of sources including published research or reports.
PLO19	19	Recognise and apply subject specific theories, paradigms, concepts or principles, for example the relationship between genes and proteins.
PLO20	20	Construct grammatically correct documents in an appropriate academic style and format, using and referencing relevant ideas and evidence.
PLO21	21	Understand the importance of academic and research integrity.
PLO22	22	Obtain and integrate several lines of subject specific evidence to formulate and test hypotheses.

## **Course Structure**

Programme Structure Description

Programme Structure - 120 credit points	
Level 3 - 120 credit points	
Level 3 Core - 120 credit points	CORE
[MODULE] 3501YAUBIO Botany Approved 2022.01 - 20 credit points	
[MODULE] 3501YAUGEN Anatomy and Physiology Approved 2022.01 - 20 credit points	
[MODULE] 3502YAUBIO General and Quantitative Analytical Chemistry Approved 2022.01 - 20 credit points	
[MODULE] 3502YAUGEN Skills and Presentations Approved 2022.01 - 20 credit points	
[MODULE] 3503YAUBIO Organic Chemistry Approved 2022.01 - 20 credit points	
[MODULE] 3504YAUBIO Soil and Fertiliser Science Approved 2022.01 - 20 credit points	
Level 4 - 120 credit points	
Level 4 Core - 120 credit points	CORE
[MODULE] 4501YAUBIO Agricultural Meteorology Approved 2022.01 - 20 credit points	
[MODULE] 4501YAUGEN Fundamentals of Scientific Research Approved 2022.01 - 20 credit points	
[MODULE] 4502YAUBIO Crop Science and Technology Approved 2022.01 - 20 credit points	
[MODULE] 4502YAUGEN Biochemistry Approved 2022.01 - 20 credit points	
[MODULE] 4503YAUBIO Plant Physiology Approved 2022.01 - 20 credit points	
[MODULE] 4504YAUBIO Genetics Approved 2022.01 - 20 credit points	
Level 5 - No credit points	
Level 5 Core - 120 credit points	CORE
[MODULE] 5501YAUBIO Microbiology and Biotechnology Approved 2022.01 - 20 credit points	
[MODULE] 5501YAUGEN Research Methods Approved 2022.01 - 20 credit points	
[MODULE] 5501YAUZOO Genes and Genomes Approved 2022.01 - 20 credit points	
[MODULE] 5502YAUBIO Crop Breeding Approved 2022.01 - 20 credit points	
[MODULE] 5503YAUBIO Analysis of Medicinal Plant Ingredients Approved 2022.01 - 20 credit points	
[MODULE] 5504YAUBIO Wild Plant Resources Approved 2022.01 - 20 credit points	
Level 6 - 120 credit points	
Level 6 Core - 120 credit points	CORE
[MODULE] 6501YAUBIO Synthetic Biology and Bioengineering Approved 2022.01 - 20 credit points	
[MODULE] 6501YAUGEN Dissertation-Research Project Approved 2022.01 - 40 credit points	I

[MODULE] 6502YAUBIO Current Topics in Biotechnology Approved 2022.01 - 20 credit points
[MODULE] 6503YAUBIO Ecology Approved 2022.01 - 10 credit points
[MODULE] 6504YAUBIO Plant Tissue Culture Approved 2022.01 - 10 credit points
[MODULE] 6505YAUBIO Bioinformatics Approved 2022.01 - 10 credit points
[MODULE] 6506YAUBIO Environmental Biotechnology Approved 2022.01 - 10 credit points

### **Teaching, Learning and Assessment**

Teaching, Learning and Assessment	The acquisition of knowledge is fostered through a range of taught sessions including lectures, computer sessions, and practical laboratory classes. Understanding of taught material is facilitated through tutorials, problem-based learning, workshops, group work and independent study. Knowledge and understanding are assessed in a variety of ways. These include: examinations (essay style questions, MCQ, data analysis and short answers),laboratory reports, practical assessments (to assess both understanding and technical competence),essays, case-studies, oral presentations, and poster presentations. Cognitive skills are developed in many areas of the programme. For example, the ability to synthesise and analyse information critically is developed in laboratory sessions from Level 4 to 6, including in the Research Project module. Applying subject knowledge and understanding to address unfamiliar problems is developed in workshops in many modules, especially in modules that utilise interpretative examination questions. Moral and ethical issues are a key part of modern biotechnology and are developed in many taught and practical sessions. Laboratory reports, scientific communication, essays and examinations allow students to demonstrate the full range of these skills and attributes. Practical and professional skills are taught during laboratory classes. Core principles and minimum standards required for effective laboratory work are introduced at Level 4, developed at Level 5, and at Level 6 the students apply these skills during their independent Research Project. These practical and professional skills and Presentations at Level 3; Fundamentals of Scientific Research at Level 4; Research Methods at Level 5, and the Research Project at Level 6). These transferable and key skills are inherent within the programme, but specifically they are taught in core modules at all Levels (Skills and Presentations at Level 3; Fundamentals of Scientific Research at Level 4; Research Methods at Level 5, and the Research Project at
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#### **Opportunities for work related learning**

#### Opportunities for work related learning

Students visit enterprises through the professional practical courses. Through the visit, students develop an understanding of the biotechnology industry. Through the graduation internship, students can complete a professional project together with the school supervisor or enterprise tutor. The ability to solve specific professional problems can be formed through the completion of a small project. During the internship, the head teacher will contact the tutor and the students to facilitate feedback. After the internship, students are required to complete their bachelor's thesis.

### **Entry Requirements**

Туре	Description
Other international requirements	Students will be recruited from the National Entrance Examination (Gao Kao). Minimum requirement for English must be 90 out of 150 for the exam in Gao Kao.

### **Programme Contacts**

#### **Programme Leader**

Contact Name

#### Link Tutor

Contact Name

Katie Evans