PROGRAMME SPECIFICATION

Bachelor of Science with Honours (Fnd) in Biotechnology

Awarding institution	LJMU Yunnan Agricultural University
Teaching institution	LJMU Yunnan Agricultural University
JACS Code	
Programme Duration	Full-Time: 4 Years
Language of Programme	All LJMU programmes are delivered and assessed in English
Subject benchmark statement	QAA Subject Benchmark Statement - Biosciences (2019)
Programme accredited by	
Description of accreditation	
Validated target and alternative exit awards	Bachelor of Science with Honours (Fnd) in Biotechnology Diploma of Higher Education in Biotechnology Certificate of Higher Education in Biotechnology
Link Tutor	Katie Evans

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 to 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.

Alternative Exit/ Interim Award Learning Outcomes - Certificate of Higher Education

A student who is eligible for this award will be able to:

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.

Operate in a range of science contexts, and take responsibility for their contributions and outputs.

Alternative Exit/ Interim Award Learning Outcomes - Diploma of Higher Education

A student who is eligible for this award will be able to:

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.

Target award Learning Outcomes - Bachelor of Science with Honours (Fnd)

A student successfully completing the programme of study will have acquired the following subject knowledge and understanding as well as skills and other attributes.

A student who is eligible for this award will be able to:

1. Appreciate fundamental concepts, principles and theories relevant to biotechnology encompassing molecular, cellular and physiological processes, microbiology, biochemistry, synthetic biology and genetics.

2. 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.

3. Engage with current developments in biotechnology and their applications, including the philosophical and ethical issues involved.

4. Critically evaluate current research in the field of biotechnology.

5. Analyse, synthesise and summarise information critically from a variety of sources including published research or reports.

6. Recognise and apply subject specific theories, paradigms, concepts or principles, for example the relationship between genes and proteins.

7. Construct grammatically correct documents in an appropriate academic style and format, using and referencing relevant ideas and evidence.

8. Understand the importance of academic and research integrity.

9. Obtain and integrate several lines of subject specific evidence to formulate and test hypotheses.

10. Apply subject knowledge and understanding to address familiar and unfamiliar problems.

11. Recognise the moral and ethical issues of investigations and appreciate the need for ethical standards and professional codes of conduct.

12. Demonstrate competence and progressive development in the basic and core experimental skills appropriate to the study of biotechnology.

13. Design, plan, conduct and report on investigations which may involve primary or secondary data.

14. Obtain, record, collate and analyse data using appropriate techniques working either individually or within a group.

15. 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.

16. Use and interpret a variety of sources of information: textual, numerical, verbal and graphical within the laboratory setting.

17. 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.

18. Prepare, process, interpret and present data using appropriate qualitative and quantitative techniques, statistical programmes, spreadsheets, bioinformatics, and programmes for presenting data visually.

19. Communicate scientific information effectively in written, verbal, and visual forms.

20. Use information technology to prepare, process and present information.

21. Identify and work towards targets for personal, academic, professional and career development.

22. 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).

Teaching, Learning and Assessment

The methods used to enable outcomes to be achieved and demonstrated are as follows:

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 are assessed through practical tests, data handling exercises, and laboratory reports, including the execution of the Research Project.

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 Level 6). These transferable and key skills are assessed through assessment activities at all levels, in all modules and specifically in the modules mentioned above.

Programme structure - programme rules and modules

Level 6	Potential Awards on completion	Bachelor of Science with Honours (Fnd)
Core	Option	Award Requirements
6501YAUBIO Synthetic Biology and Bioengineering (20 credits) 6501YAUGEN Dissertation-Research Project (40 credits) 6502YAUBIO Current Topics in Biotechnology (20 credits) 6503YAUBIO Ecology (10 credits) 6504YAUBIO Plant Tissue Culture (10 credits) 6505YAUBIO Bioinformatics (10 credits) 6506YAUBIO Environmental Biotechnology (10 credits)		120 core credits at level 6 0 option credits at level 6

Level 5	Potential Awards on completion	
Core	Option	Award Requirements
5501YAUBIO Microbiology and Biotechnology (20 credits) 5501YAUGEN Research Methods (20 credits) 5501YAUZOO Genes and Genomes (20 credits) 5502YAUBIO Crop Breeding (20 credits) 5503YAUBIO Analysis of Medicinal Plant Ingredients (20 credits) 5504YAUBIO Wild Plant Resources (20 credits)		120 core credits at level 5 0 option credits at level 5

Level 4	Potential Awards on completion	
Core	Option	Award Requirements
4501YAUBIO Agricultural Meteorology (20 credits) 4501YAUGEN Fundamentals of Scientific Research (20 credits) 4502YAUBIO Crop Science and Technology (20 credits)		120 core credits at level 4 0 option credits at level 4

4502YAUGEN Biochemistry (20 credits) 4503YAUBIO Plant Physiology (20 credits) 4504YAUBIO Genetics (20 credits)		

Level 3	Potential Awards on completion	
Core	Option	Award Requirements
3501YAUBIO Botany (20 credits) 3501YAUGEN Anatomy and Physiology (20 credits) 3502YAUBIO General and Quantitative Analytical Chemistry (20 credits) 3502YAUGEN Skills and Presentations (20 credits) 3503YAUBIO Organic Chemistry (20 credits) 3504YAUBIO Soil and Fertiliser Science (20 credits)		120 core credits at level 3 0 option credits at level 3

Information about assessment regulations

All programmes leading to LJMU awards operate within the University's Academic Framework.
https://www.ljmu.ac.uk/about-us/public-information/academic-quality-and-regulations/academic-framework

Opportunities for work-related learning (location and nature of activities)

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.

Criteria for admission

Overseas qualifications
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.

External Quality Benchmarks

All programmes leading to LJMU awards have been designed and approved in accordance with the UK Quality Code for Higher Education, including the Framework for Higher Education Qualifications in the UK (FHEQ) and subject benchmark statements where applicable.

The University is subject to periodic review of its quality and standards by the Quality Assurance Agency (QAA) Published review reports are available on the QAA website at www.qaa.ac.uk

Programmes which are professionally accredited are reviewed by professional, statutory and regulatory bodies (PSRBs) and such programmes must meet the competencies/standards of those PSRBs.

Support for students and their learning

The University aims to provide students with access to appropriate and timely information, support and guidance to ensure that they are able to benefit fully from their time at LJMU. All students are assigned a Personal Tutor to provide academic support and when necessary signpost students to the appropriate University support services.

Students are able to access a range of professional services including:

- Advice on practical aspects of study and how to use these opportunities to support and enhance their

personal and academic development. This includes support for placements and careers guidance.

- Student Advice and Wellbeing Services provide students with advice, support and information, particularly in the areas of: student funding and financial matters, disability, advice and support to international students, study support, accommodation, health, wellbeing and counselling.
- Students studying for an LJMU award at a partner organisation will have access to local support services

Methods for evaluating and improving the quality and standards of teaching and learning

Student Feedback and Evaluation

The University uses the results of student feedback from internal and external student surveys (such as module evaluations, the NSS and PTES), module evaluation questionnaires and meetings with student representatives to improve the quality of programmes.

Staff development

The quality of teaching is assured through staff review and staff development in learning, teaching and assessment.

Internal Review

All programmes are reviewed annually and periodically, informed by a range of data and feedback, to ensure quality and standards of programmes and to make improvements to programmes.

External Examining

External examiners are appointed to programmes to assess whether:

- the University is maintaining the threshold academic standards set for awards in accordance with the FHEQ and applicable subject benchmark statements
- the assessment process measures student achievement rigorously and fairly against the intended outcomes of the programme(s) and is conducted in line with University policies and regulations
- the academic standards are comparable with those in other UK higher education institutions of which external examiners have experience
- the achievement of students are comparable with those in other UK higher education institutions of which the external examiners have experience

and to provide informative comment and recommendations on:

- good practice and innovation relating to learning, teaching and assessment observed by external examiners
- opportunities to enhance the quality of the learning opportunities provided to students

Please note:

This specification provides a concise summary of the main features of the programme and the learning outcomes that a typical student might reasonably be expected to achieve and demonstrate if he/she takes full advantage of the learning opportunities that are provided. More detailed information on the learning outcomes, content, teaching, learning and assessment methods of each module can be found in module and programme guides.