Programme Specification

Solihull College

Title of Programme: HNC Applied Biology

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 s/he takes full advantage of the learning opportunities that are provided.

1.	**Awarding Body**	Edexcel BTEC
2.	**Teaching location**	Blossomfield Campus, Solihull College
3.	**Accreditation details**	BTEC HNC Diploma in Applied Biology (QCF)
4.	**Final award**	Higher National Certificate
5.	**Name of award**	Higher National Certificate in Applied Biology
6.	**Codes**	
	a. UCAS code	n/a
	b. Solihull Qualification Code	QMS4BS01/BAPHE MK102
	c. Edexcel Programme Code (& approval dates)	01/09/10 – 31/08/15
7.	**QAA Subject Benchmark or other external reference**	Biosciences 2007
8.	**Date this specification applies from**	September 2013

Approved

Keith Rathbone
Head of School
Sixth Form and Access to H.E.

9. Educational Aims of the Programme

Edexcel BTEC Higher Nationals in Applied Biology have been developed to focus on:

- the education and training for a range of careers in biological/biomedical sciences and allied scientific/medical industries
- opportunities for those employed within these industries to achieve a nationally recognised higher level vocationally specific qualification
- opportunities for full-time learners to gain a nationally recognised vocationally specific higher level qualification to enter employment within these industries at supervisory or management level or to progress to higher education vocational qualifications such as a full-time degree in biological/biomedical sciences or a related subject area
- expansion of the knowledge, understanding and skills of learners from an applied biology or allied industry supervisor's or manager's viewpoint
- opportunities for learners to develop a range of skills, techniques and attributes essential for successful performance in working life.

This qualification meets the needs of the above rationale by:

- giving individuals knowledge, understanding and skills for successful employment in scientific/medical and allied industries
- enabling progression to an undergraduate degree or further professional qualifications in related areas
- providing opportunities for specialist study relevant to individual vocations and contexts
- developing the individual's ability in scientific/medical and allied industries through effective use and combination of the knowledge and skills gained in different parts of the programme
- developing a range of skills and techniques, personal qualities and attributes essential for successful performance in working life and thereby enabling learners to make an immediate contribution to employment
- providing flexibility, knowledge, skills and motivation as a basis for future studies and career development in biological/biomedical sciences and allied industries

The wide-ranging programme offered at Solihull College covering scientific theory, laboratory techniques and data analysis enables students to secure employment in a range of scientific contexts as well as progressing to an honours degree at another higher education provider. At present, Solihull College does not offer honours degree programmes in biological/biomedical sciences

10. Intended Learning Outcomes

The programme provides opportunities for students to develop and demonstrate knowledge and understanding, skills, qualities and other attributes in the following areas:

Subject knowledge and critical understanding including:

- Basic principles of biological science, human/animal anatomy and physiology, biochemistry and chemistry, genetics, pharmacology, microbiology, infectious diseases, immune response system and human nutrition.
- Practical biological skills e.g. microscopy, titration, spectroscopy, chromatography, immunological techniques, growing cells in culture
- Health management of individuals (role of nutrients in relation to body function)
- Basic principles of the function of physiological systems, homeostatic control mechanisms and cellular communication via the central nervous system
- Drug treatments of diseases affecting the nervous system
- Theoretical and practical aspects of medical and industrial microbiology and the relationship between infection and disease
- The basic legal, ethical and safety issues underpinning professional practice.
- Basic principles and techniques for carrying out small scale research studies within the subject area, including basic knowledge of data analysis (including software tools) and use of statistics in biological research
- Understanding of the limitations of their knowledge and understanding and when they should seek further professional guidance within the work environment

Higher level academic/ intellectual skills including:

- The ability to read and use appropriate literature with a full and critical understanding.
- The capacity to give a clear and accurate account of a subject, marshal arguments and engage in debate and dialogue with specialists and non-specialists.
- The ability to apply underlying biological concepts and principles outside the context in which they were first studied including, where appropriate, the application of those principles in an employment context
- Knowledge of the main methods of enquiry in their subject and ability to evaluate critically the appropriateness of different approaches to solving problems in the field of study and workplace
- An understanding of the limits of their knowledge and how this influences analysis and interpretations based on that knowledge
- Collecting and integrating several lines of evidence and applying them in a balanced way in an argument
- The ability to design an experiment, investigation, survey or other means to test a hypothesis or proposition.
- The ability to apply subject knowledge and understanding to address familiar and unfamiliar problems particularly in the vocational setting.

Higher practical and professional skills including:

- The ability to maintain and develop skills for employment.
- The ability to complete a range of operational tasks successfully
- The ability to undertake laboratory based project work and produce scientific reports.
- The ability to utilise appropriate qualitative and quantitative techniques to analyse results.
- The ability to plan, design, undertake and communicate the findings for an individual project.
- The ability to effectively communicate information, arguments and analysis, in a variety of forms, to specialist and non-specialist audiences.
- The ability to undertake further training, develop existing skills and acquire new competences that will enable them to assume responsibility within organisations.

Higher Level transferable skills development including:

- The ability to use information technology effectively including using computers to solve problems and communicate effectively; using the internet and other electronic sources critically as a means of sourcing information
- The ability to use numeracy effectively in the workplace and when presenting research data.
- To have effective written and oral communication skills including: the ability to communicate about their subject to a variety of audiences using a range of formats and approaches; citing and referencing work in an appropriate manner.
- The ability to work as a member of a team including identifying personal and collective goals and responsibilities and performing in a manner appropriate to these roles; recognising and respecting the views and opinions of other team members.
- Independently managing tasks including identifying and solving problems.
- Monitoring, developing and reflecting on their own performance along with identifying targets for personal, academic and career development.
- Developing an adaptable, flexible and effective approach to study and work

Teaching and Learning Methods

- Acquisition of knowledge and understanding is through a mixture of lectures, presentations, group and individual activities within class, laboratory demonstrations, practicals, tutorials, group seminars, small scale research projects and self - directed study.
- Course information, Information from taught sessions and for each module is provided on the college's intranet - Moodle
- Practical techniques are an essential component of the programme.
- Transferable skills such as oral and written communication will be developed in group and tutorial sessions, through assignments and particularly through project work.
- Study visits will be organised for experiential value and to offer students opportunities to further their own research and gain direct experience and data from vocational contexts. These trips all feed directly into assignment work.
- Personal development planning including how to develop all higher level skills will be incorporated into regular meetings and reviews with an allocated personal development tutor.

Assessment methods

Informal assessment for learning and feedback includes:

Short traditional lectures are delivered by staff and used mainly to transfer the underpinning knowledge, technical information and concepts. The lectures are planned to stimulate and guide further reading and self-directed study and are usually followed by one of the following assessment methods.

Interactive lectures and question & answer sessions can be used to examine student understanding and identify any additional guidance required.

Group activities involve students actively contributing to, leading and participating in discussions and debates on a wide range of subject areas, undertaking games or group activities allowing immediate assessment and feedback.

Workshops are for students to develop skills in self-directed study with the support of tutors. These sessions will be supported by staff but not staff led. There will also be self-directed time for students to further develop these skills and spend time reading around topics using a variety of recommended sources.

Practical sessions will give the students opportunity to develop skills. These sessions will develop team-working, interpersonal, people management and problem solving skills.

Presentations are used to support research skills, organisation, time-management skills, and are also a confidence-building tool.

Assessment methods will vary for different modules. Each module will include a variety of formal and informal methods from the lists above.

Please see – Appendix 1, showing the mapping of where outcomes in section 10 are developed, achieved and assessed

11. Programme Structure

Student commences HE study at Level 4

Mandatory Core Units	**Centre Specialist Option Units**	**Achievement:**
• Cell Biology (L4 - 15 credits) • Biochemistry of Macromolecules and Metabolic Pathways (L5 - 15 credits) • Physiology of Cellular Systems in Animals (L4 - 15 credits) • Laboratory Techniques For Applied Biology (L4 - 15 credits) • Analysis of Scientific Data and information (L4 - 15 credits)	• Pharmacological Principles of Drug Action (L5 – 15 credits) • Medical Microbiology (L5 – 15 credits) • Human Health and Nutrition (L4 – 15 credits) • Chemistry for Applied Biologists (L4 – 15 credits)	To achieve the Higher National Certificate, students must achieve 120 credits. This includes a minimum of 65 credits at level 4. This qualification is part-time over 2 years.

Completion of BTEC Higher National Diploma

Units are chosen to provide a wide coverage of the diversity of applied biology topics and career directions that can be taken along with ensuring underpinning core principles are covered.

BTEC Applied Biology students may go on to the following careers: Research Scientist, Haematologist, Dental Technician, Medical Researcher, Nurse, Physicist, Chemist and Biologist.

BTEC Applied Biology achievers may go on to work in the following environments: Health Service Providers, Government Establishments, Research and Educational Institutions, Blood Banks, Medical Research Departments and Hospital/Veterinary Laboratories.

Upon successful completion of the HNC in Applied Biology, students have the option of progressing on to an HND course or completing a "top up" degree or joining an Honours Degree programme in year 2 (a short bridging course may be required). Some available options are:

- **Sheffield Hallam University** – (2 year top up)
  • BSc (Honours) Biology
  • BSc (Honours) Biomedical Sciences
  • BSc (Honours) Human Biology

- **Oxford Brookes University** - BSc (Honours) Physiotherapy

Support and advice will be offered to students wishing to continue to degree level.

12. Support for Students and Their Learning

Student progression on course is supported both by subject tutors and central College services and includes:

- An induction programme introducing new students to the subject of study, higher level skills that need to be developed, and the college facilities (including the library, IT facilities, staff and other students).
- College and course handbooks available in print and electronic format on Moodle.
- Personal and academic support is integrated in teaching provided by supportive and accessible tutors and identified 1:1 support sessions are also available.
- Biology labs with up to date equipment, a modern well-equipped library and up-to-date ICT equipment.
- Study skills sessions integrated in programme.
- Personal development planning sessions integrated into programme
- Up-to-date Computer laboratories with specialist facilities for computer networking and multimedia computing.
- Access to counsellors and support for students with additional needs.
- Written assignment / assessment feedback (normally provided within 3 weeks of assessment submission).
- Regular 1:1 and group tutorial support
- Access to regularly updated course section and college wide sections on the college's intranet Moodle

13. Criteria for Admission

Normally the course enrols students, who are in, or plan to enter, employment and who have reached the minimum age of 18. Students who enter with at least one of the following qualifications:

Entry Requirements:
4 GCSEs grade C or above to include English, Maths and Science (or equivalent level 2 qualifications in these subjects), **plus**

- 1 A2 Level or 2 AS Levels (in a science subject)
- Level 3 Access to H.E. Science certificate or NVQ Level 3 (science related subject)
- BTEC National or Extended Diploma in Applied Science (at least MMM)
- Level 3 Diploma in Applied Science (MM) plus science related AS
- Or an equivalent qualification.

(Students with existing level 4/5 qualifications may be eligible for some accreditation for prior learning. This will be discussed on an individual basis.)

Mature students, over the age of 21, with a suitable background or experience may be accepted without formal qualifications. All such students are invited to interview before an offer is made.

Successful completion of diagnostic test

14. Evaluating and improving the Standards of Teaching and Learning

Course quality is scrutinised by our internal verification process and the Edexcel appointed external examiner who examines student work and who meets and discusses the course with staff and students. Student opinions on course delivery play a vital part in our quality monitoring and improvement procedures.

This is heard through student course representatives attending meetings and is gathered through the circulation of questionnaires to individual students.

- HE Student feedback questionnaires at college level
- Students module review questionnaires at the end of each semester at course level
- Programme Quality Board (student representatives have direct access to the Senior Director for Services at these meetings) x 2 a year
- Students send representatives to the Student Council

The quality of the programme is checked both internally and externally by:

- Annual teaching observation scheme
- Staff reviews 3 times per year
- External Examiners verbal and written feedback
- Annual Monitoring Report
- Annual staff appraisals

15. Regulation of Assessment

An Annual Monitoring Report (AMR) is completed every year, the last section of which is a Quality Improvement Plan (QIP), written by the course leader with help and input from the teaching and tutoring team. This is passed to the Head of School of Services for audit and from there to the HE Quality and Standards Board.

Assessment and assessment briefs are regulated by the internal verification system for the programme.

External examination of assessment and of the provision and standards of teaching are regulated by Edexcel BTEC. The programme is periodically revalidated by Edexcel BTEC. Edexcel BTEC appoints the External Examiner who visits annually and submits a report. The External Examiner works with the programme manager to consider and review the quality of the assessment planning, the validity of assessment decisions and the consistency of the assessment process.

The programme is also subject to periodic review by QAA (IQER).

16. Enhancement

Actions identified in the evaluation process are developed into the enhancement plan for the improvement of teaching and learning across the whole programme. A Quality Improvement Plan (QIP) is produced which feeds into the Faculty Higher Education (HE) SAR, which is then reported at the HE Quality and Standards Board.

Good practice in Teaching and Learning is developed through regular staff development and staff meetings at programme and school level. Lecturers take part in Internal Verification of fellow lecturer's assignments and assignment briefs.

Development and enhancement of individual lecturers knowledge of up to date business practices and of modern teaching practices is ensured through the annual appraisal scheme. Lecturers are encouraged to identify their own needs and to make their own arrangements with suitable companies to update their skills and knowledge. Lecturers can undertake further qualifications, attend external conferences and briefing sessions, and undertake online training as appropriate.

Enhancement of the student learning experience takes place via the arrangements of visits both academic and social, the introduction of speakers from outside the College, usually from a related background. All this increases the experience of the student and also adds to their knowledge and understanding on a more practical level.

The Course is enriched for students by the inclusion of a number of trips to various vocational establishments.

17. Programme Resources

- Vocationally relevant equipment (e.g. models / skeletons, microscopes etc)
- Student resource facility for the loan of specialist equipment (e.g. lap top computers, digital cameras, video cameras etc)
- Well stocked library with frequent review and update of books.
- E-library resources.
- College laboratory facilities equipped for practical experiments.
- External links with industry for student trips or external specialist speakers.
- Dedicated Higher Education computing area.

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 s/he takes full advantage of the learning opportunities that are provided. More detailed information can be found in the programme handbook.

Document History

1. Created October 2013

Programme Leader	Helen Johnson
Web address	http://www.solihull.ac.uk/hnd_applied_biology_edexcel-53431.html
Date checked against public information	*22/02/13*
Specification Author	Helen Johnson

APPENDIX 1: Mapping of the achievement of the HNC in Applied Biology programme's outcomes.

Subject knowledge and critical understanding

Module number	1	2	3	4	5	12	15	16	22	*
Basic principles of biological science, anatomy and physiology, biochemistry, chemistry, genetics, pharmacology, microbiology, infectious diseases, immune response system and human nutrition	✓	✓	✓	✓		✓	✓	✓	✓	✓
Practical biological skills e.g. microscopy, titration, spectroscopy, chromatography, immunological techniques, growing cells in culture	✓	✓	✓	✓			✓	✓	✓	✓
Health management of individuals (role of nutrients in relation to body function)	✓	✓		✓				✓		✓
Basic principles of the function of physiological systems, homeostatic control mechanisms and cellular communication via the central nervous system	✓	✓	✓	✓	✓	✓	✓			✓
Drug treatments of diseases affecting the nervous system	✓	✓		✓	✓	✓	✓			✓
Theoretical and practical aspects of medical and industrial microbiology and the relationship between infection and disease	✓			✓			✓			✓
The basic legal, ethical and safety issues underpinning professional practice	✓	✓	✓	✓		✓	✓	✓	✓	✓
Basic principles and techniques for carrying out small scale research studies within the subject area, including basic knowledge of data analysis (including software tools) and use of statistics in biological research				✓	✓					✓
Understanding of the limitations of their knowledge and understanding and when they should seek further professional guidance within the work environment	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓

Higher level academic/ intellectual skills

Module number	1	2	3	4	5	12	15	16	22	*
The ability to read and use appropriate literature with a full and critical understanding	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
The capacity to give a clear and accurate account of a subject	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
The capacity to marshal arguments and engage in debate and dialogue with specialists and non-specialists										✓
The ability to apply underlying biological concepts and principles outside the context in which they were first studied including, where appropriate, the application of those principles in an employment context	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Knowledge of the main methods of enquiry in their subject and ability to evaluate critically the appropriateness of different approaches to solving problems in the field of study and workplace	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
An understanding of the limits of their knowledge and how this influences analysis and interpretations based on that knowledge	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Collecting and integrating several lines of evidence and applying them in a balanced way in an argument				✓	✓					✓
The ability to design an experiment, investigation, survey or other means to test a hypothesis or proposition				✓	✓					✓
The ability to apply subject knowledge and understanding to address familiar and unfamiliar problems particularly in the vocational setting	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓

Higher practical and professional skills

Module number	1	2	3	4	5	12	15	16	22	*
The ability to maintain and develop skills for employment	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
The ability to complete a range of operational tasks successfully	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
The ability to undertake laboratory based project work and produce scientific reports		✓								✓
The ability to utilise appropriate qualitative and quantitative techniques to analyse results		✓								✓
The ability to plan, design, undertake and communicate the findings for an individual project		✓								✓
The ability to effectively communicate information, arguments and analysis, in a variety of forms, to specialist and non-specialist audiences	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
The ability to undertake further training, develop existing skills and acquire new competences that will enable them to assume responsibility within organisations	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓

Higher Level transferable skills development

Module number	1	2	3	4	5	12	15	16	22	*
The ability to use information technology effectively including using computers to solve problems and communicate effectively; using the internet and other electronic sources critically as a means of sourcing information	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
The ability to use numeracy effectively in the workplace and when presenting research data	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
To have effective written and oral communication skills including: the ability to communicate about their subject to a variety of audiences using a range of formats and approaches; citing and referencing work in an appropriate manner	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
The ability to work as a member of a team including identifying personal and collective goals and responsibilities and performing in a manner appropriate to these roles	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Recognising and respecting the views and opinions of other team members	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Independently managing tasks including identifying and solving problems	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Monitoring, developing and reflecting on their own performance along with identifying targets for personal, academic and career development	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Developing an adaptable, flexible and effective approach to study and work	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓

Module Key:

Unit 1 – Cell Biology (L4)
Unit 2 – Biochemistry of Macromolecules and Metabolic Pathways (L5)
Unit 3 – Physiology of Cellular Systems in Animals (L4)
Unit 4 – Laboratory Techniques for Applied Biology (L4)
Unit 5 – Analysis of Scientific Data and Information (L4)
Unit 12 – Pharmacological Principles of Drug Action (L5)
Unit 15 – Medical Microbiology (L5)
Unit 16 – Human Health and Nutrition (L4)
Unit 22 – Chemistry for Applied Biologists (L4)
Module * tutorial time