UNIVERSITY OF SURREY

Programme Specification (Biomedical Science/ Applied Biomedical Science)

1. Awarding Institution / Body	**University of Surrey**
2. Teaching Institution	**Nescot**
3. Accrediting Authority	**IBMS**
4. Final Award	**BSc (Hons), Dip HE, Cert HE**
5. Name of Route/Pathway or Field	**Biomedical Science**
6. UCAS Code	**B940**
7. QAA Benchmarking Group	**Biomedical Science**
8. Date of production/revision	**April 2007**

9. Main educational aims of programme

- To enable students to gain a Certificate in Higher Education, a Diploma in Higher Education or a BSc with Honours in Biomedical Science
- To advance student academic, professional and laboratory skills for current and future employment in biomedical or laboratory science
- To support students in the acquisition of effective study, communication and IT skills
- To develop analytical and evaluative skills in students
- To encourage the development of autonomous student learning
- To provide support for students from diverse backgrounds

10. Programme outcomes - *the programme provides opportunities for students to achieve and demonstrate the following learning and educational outcomes.*

Knowledge and understanding of:

1. Maths, statistics, chemistry, data handling, laboratory methods and computing.
2. Core areas of biology: cell structure/function, anatomy, physiology, genetics, biological molecules.
3. Biological sciences which require integration of core areas: biology of disease, cell physiology, pharmacology, toxicology, human physiology, immunology, molecular biology & genetics.
4. Biomedical science specialisms: cell pathology, clinical biochemistry, clinical immunology, haematology & transfusion, medical microbiology,
5. Scope and application of laboratory-based diagnostic procedures
6. Health and safety, record keeping, confidentiality, professional and ethical issues.

Teaching and learning strategies and methods

Knowledge and understanding will be acquired via lectures, tutorials, seminars, poster presentations, practicals, resource-based, web-based and problem-based e-learning, guided independent learning and visits. Students will acquire experience in the processes involved in the conduct and presentation of original scientific research in the completion of an independent research project.

Assessment: Knowledge and understanding of the learning outcomes of all modules will be assessed via examinations and coursework, including practical reports, seminars, essays, case studies and the completion of a research report/thesis.

Cognitive (thinking) skills - able to:

1. Select and integrate information and data from a variety of sources;
2. Critically evaluate and analyse information
3. Solve problems and formulate and test hypotheses;
4. Take a holistic approach in solving problems, applying professional judgements balancing benefits, safety, reliability and ethical considerations;
5. Reflect on current professional practice within both educational and laboratory contexts.
6. Demonstrate and exercise independence of mind and thought.
7. Use the scientific literature effectively to develop their own knowledge base and understanding and formulate their own scientific theories, arguments and ideas

Teaching and Learning Strategies and Methods:

Cognitive skills will be developed throughout the teaching and learning programme. Each module involves discussion, practice in applying concepts, analysis and interpretation of data, and individual/group feedback sessions for learners on work produced. The development of these skills will be enhanced by the students' completion of an individual research project.

Assessment: Cognitive skills will be assessed using a variety of assessment methods including: coursework, examinations, practical work, laboratory experimental reports, case studies, poster and seminar presentations and the completion of an independent research project.

Practical skills - able to:

1. Use laboratory apparatus safely, carefully, precisely and efficiently;
2. Use a wide range of laboratory and physiological measurement equipment to generate data.
3. Plan and execute laboratory work with the ability to adapt to unexpected results and adopt /develop new technology to solve problems;
4. Define a research problem, design experimental strategies and carry out experiments to obtain the information required;
5. Write good clear laboratory reports and give technical seminar presentations based on their own and others' experimental findings

Teaching and Learning Strategies and Methods

Practical skills : Practical and professional skills are emphasised throughout the curriculum. These will be developed through laboratory practical experiments, case studies and interpretative exercises. For part-time students skills are augmented by work-based laboratory practice; for full-time students additional laboratory modules have been incorporated into the scheme to further develop these skills and provide parity of the learning experience between part-time and full-time students.

Skill 5 is developed throughout the curriculum via practical reports and/or poster presentations.

Assessment of practical skills:

These will be assessed primarily through laboratory reports and portfolios of evidence. Some assessment will be by poster or oral presentations**.**

Key / transferable skills - able to:

1. Structure and communicate ideas effectively at degree level, in writing, verbally and through drawings and graphical representations
2. Apply mathematical skill relevant to laboratory science (basic calculations; statistics)
3. Use information and communications technology;
4. Solve problems;
5. Work with others as a member of a team;
6. Improve own learning and performance;
7. Manage time and work to deadlines
8. Work independently and be self-reliant.

Teaching and Learning Strategies and Methods

Transferable skills will be introduced in the first year modules ICT & Study Skills (all students) and in Employment and the Workplace (full-time) or Workplace Organisation (part-time). They will be reiterated and developed throughout the programme using a range of teaching methods including seminars, group work and reflection,. IT skills will be developed with appropriate in-class exercises.

Assessment

The modules named above will be assessed by portfolio and in-class tests. For other modules, assessment will be incorporated into the full range of assessment strategies including examinations, essays, practical reports, case studies, seminars and posters.

11. Route/Pathway/Field requirements, levels, modules, credits and awards

The programme is offered in full-time and part-time mode, with the two modes sharing two-thirds of the programme. The remaining third is college-based for the full-time route and work-based for the part-time route (all part-time students must be employed in a relevant workplace). The aims and programme outcomes are identical for the two routes. The full-time programme is offered as a normal 3-year route or an extended programme for up to 6 years.

Students will attain a BSc (Hons) in Biomedical Science (IBMS accredited) if they obtain 120 credits at Level 1; 120 credits at Level 2 and 120 credits at Level 3 as per the above programme.
Students will attain a DipHE in Biomedical Science if they obtain 120 credits at Level 1 and 120 credits at Level 2 or equivalent
Students will attain a CertHE in Biomedical Science if they obtain 120 credits at Level 1 or equivalent

Credit Level 3. Potential Awards – BSc and BSc (Hons) degree

Compulsory modules
Molecular Genetics
Project (double) (Hons only)
Cellular Pathology
Clinical Biochemistry
Clinical Immunology
Haematology & Transfusion
Medical Microbiology

Optional modules

None

Award requirements
Completion of 8 Level 3 modules will allow student to achieve award. of BSc (Hons) Biomedical Science

Professional Year - Description

N/A

Progression

Credit Level 2. Potential Award – Dip. HE

Compulsory modules
Cell Physiology & Immunology
Biochemistry
Molecular Biology & Genetics
Biology of Disease
Project Preparation
Analytical Techniques & Statistics
Applied Human Physiology
Pharmacology & Toxicology

Alternative modules

None

Progression
Completion of 8 Level 2 modules (120 credits) will allow students to progress
.

Credit Level 1. Potential Award – Cert. HE

Compulsory modules
ICT & Study Skills
Cell Biology
Microbial & other causes of Disease
Chemistry for Biology
Anatomy & Physiology

Alternative modules
Full-time:
Employment and the Workplace
Laboratory methods 1
Laboratory methods 2
Part-time:
Workplace organisation
Case Study
Professional Practice - BMS specialist options

Students must take **either** part-time **or** full-time options

Progression
Completion of 8 Level 1 modules (120 credits) at Level 1 will allow students to progress.

UNIVERSITY OF SURREY

Programme Specification – Applied Biological Science

1. Awarding Institution / Body	**University of Surrey**
2. Teaching Institution	**Nescot**
3. Accrediting Authority	**-**
4. Final Award	**BSc (Hons), BSc, Dip HE, Cert HE**
5. Name of Route/Pathway or Field	**Applied Biological Science**
6. UCAS Code	**-**
7. QAA Benchmarking Group	**Bioscience**
8. Date of production/revision	**July 2007**

9. Main educational aims of programme

- To enable students to gain a Certificate in Higher Education, a Diploma in Higher Education, a BSc or a BSc with Honours in Applied Biological Science
- To advance student academic, professional and laboratory skills for current and future employment in applied laboratory science, including the pharmaceutical industry, analytical laboratory services, and veterinary and biomedical research and diagnostics.
- To support students in the acquisition of effective study, communication and IT skills
- To develop transferable analytical and evaluative skills in students
- To encourage the development of autonomous student learning
- To provide support for students from diverse backgrounds

10. Programme outcomes - *the programme provides opportunities for students to achieve and demonstrate the following learning and educational outcomes.*

Knowledge and understanding of:

1. Basic science: chemistry, mathematics, statistics.
2. Laboratory technology: the laboratory method; data handling; computing; scope and application of laboratory-based investigations.
3. Core biology: biological molecules; processes and mechanisms of life at molecular, cellular and whole organism level.
4. Integration and applications of core areas: biology of disease, pharmacology, toxicology, physiology, immunology, molecular biology & genetics.
5. In-depth knowledge of chosen subject areas from a range of biological and biomedical options
6. The laboratory in the workplace: health and safety, record keeping, confidentiality, professional and ethical issues.

Teaching and learning strategies and methods

A variety of teaching and learning strategies will be employed to encourage student knowledge and understanding. These will include a varied mix of lectures, tutorials, seminars, poster presentations, practicals, resource-based, web-based and problem-based e-learning, guided independent learning and visits. Students will acquire experience in the processes involved in the conduct and presentation of original scientific research in the completion of an independent research project.

Assessment: Knowledge and understanding of the learning outcomes of all modules will be assessed via examinations and coursework, including practical reports, seminars, essays, case studies and the completion of a research report/thesis.

Cognitive (thinking) skills - able to:

1. Select and integrate information and data from a variety of sources;
2. Critically evaluate and analyse information
3. Solve problems and formulate and test hypotheses;
4. Take a holistic approach in solving problems, applying professional judgements balancing benefits, safety, reliability and ethical considerations;
5. Reflect on current professional practice within both educational and laboratory contexts.
6. Demonstrate and exercise independence of mind and thought.
7. Use the scientific literature effectively to develop their own knowledge base and understanding and formulate their own scientific theories, arguments and ideas

Teaching and Learning Strategies and Methods:

Cognitive skills will be developed throughout the teaching and learning programme. Each module involves discussion, practice in applying concepts, analysis and interpretation of data, and individual/group feedback sessions for learners on work produced. The development of these skills will be enhanced by the students' completion of an individual research project.

Assessment: Cognitive skills will be assessed using a variety of assessment methods including: coursework, examinations, practical work, laboratory experimental reports, case studies, poster and seminar presentations and the completion of an independent research project.

Practical skills - able to:

1. Use laboratory apparatus safely, carefully, precisely and efficiently;
2. Use a wide range of laboratory and physiological measurement equipment to generate data.
3. Plan and execute laboratory work with the ability to adapt to unexpected results and adopt /develop new technology to solve problems;
4. Define a research problem, design experimental strategies and carry out experiments to obtain the information required;
5. Write good clear laboratory reports and give technical seminar presentations based on their own and others' experimental findings

Teaching and Learning Strategies and Methods

Practical skills : Practical and professional skills are emphasised throughout the curriculum. These will be developed through laboratory practical experiments, case studies and interpretative exercises. For part-time students skills are augmented by work-based laboratory practice; for full-time students additional laboratory modules have been incorporated into the scheme to further develop these skills and provide parity of the learning experience between part-time and full-time students.

Skill 5 is developed throughout the curriculum via practical reports and/or poster presentations.

Assessment of practical skills:

These will be assessed primarily through laboratory reports and portfolios of evidence. Some assessment may be by poster or oral presentation**.**

Key / transferable skills - able to:

1. Structure and communicate ideas effectively at degree level, in writing, verbally and through drawings and graphical representations
2. Apply mathematical skill relevant to laboratory science (basic calculations; statistics)
3. Use information and communications technology;
4. Solve problems;
5. Work with others as a member of a team;
6. Improve own learning and performance;
7. Manage time and work to deadlines
8. Work independently and be self-reliant.

Teaching and Learning Strategies and Methods

Transferable skills will be introduced in the first year modules ICT & Study Skills (all students) and in Employment and the Workplace (full-time) or Workplace Organisation (part-time). They will be reiterated and developed throughout the programme using a range of teaching methods including seminars, group work and reflection,. IT skills will be developed with appropriate in-class exercises.

Assessment

The modules named above will be assessed by portfolio and in-class tests. For other modules, assessment will be incorporated into the full range of assessment strategies including examinations, essays, practical reports, case studies, seminars and posters.

[Other skills may be defined here, as applicable]- able to:

Teaching and Learning Strategies and Methods

Assessment

11. Route/Pathway/Field requirements, levels, modules, credits and awards

The programme is offered in full-time and part-time mode, with the two modes sharing two-thirds of the programme. The remaining third is college-based for the full-time route and work-based for the part-time route (all part-time students must be employed in a relevant workplace). The full-time programme is offered as a normal 3-year route or an extended programme for up to 6 years.

Students will attain a CertHE in Applied Biological Science if they obtain 120 credits at Level 1 or equivalent.

They will have gained knowledge and understanding of the factual basis which underlies applied biological science and have developed basic practical and technical skills. They will be able to work accurately and carefully under supervision.

Students will attain a DipHE in Applied Biological Science if they obtain 120 credits at Level 1 and 120 credits at Level 2 or equivalent. They will have attained an understanding of the theory which underlies applied biological science, and a basic level of analytical and evaluative skills. They will have the ability to work autonomously within given guidelines in a laboratory setting.

Students will attain a BSc in Applied Biological Science is they obtain 120 credits at Level 1, 120 credits at Level 2 and 60 credits at Level 3 or equivalent. They will have attained a critical understanding of the theory which underlies applied bioscience and have developed a high level of analytical and evaluative skills enabling them to integrate theory and practice, to critically analyse data and to generate ideas. They will be able to work autonomously with little supervision.

Students will attain a BSc (Hons) in Applied Biological Science if they obtain 120 credits at Level 1, 120 credits at Level 2 and 120 credits at Level 3 or equivalent. Students will have achieved a high level of critical and analytical skills, showing good application of theory to practice and an ability to generate ideas and solutions to problem. They will be able to work autonomously and effectively in a wide range of professional contexts.

Credit Level 3. Potential Awards – BSc and BSc (Hons) degree

Compulsory modules
Molecular Genetics
Project (double)

Optional modules

5 of:
Biotechnology
Cell Communication & Signal Transduction
Cellular Pathology
Clinical Biochemistry
Clinical Immunology
Haematology & Transfusion
Medical Microbiology

Award requirements
Completion of 8 Level 3 modules will allow students to achieve award of BSc (Hons) Applied Biological Science

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Completion of 4 Level 3 modules will allow students to achieve award of BSc (Ordinary) Applied Biological Science

Professional Year - Description

N/A

Progression

Credit Level 2. Potential Award – Dip. HE

Compulsory modules

Biochemistry
Molecular Biology & Genetics
Biology of Disease
Project Preparation
Analytical Techniques & Statistics

Alternative modules

1 of:
Applied Human Physiology or
Comparative Physiology

2 of:
Cell Physiology & Immunology or
Nutrition or Pharmacology & Toxicology

Progression
Completion of 8 Level 2 modules (120 credits) will allow students to progress
.

Credit Level 1. Potential Award – Cert. HE

Compulsory modules
ICT & Study Skills
Cell Biology
Microbial & other causes of Disease
Chemistry for Biology
Anatomy & Physiology

Alternative modules
Full-time:
Employment and the Workplace
Laboratory methods 1
Laboratory methods 2
Part-time:
Workplace organisation
Case Study
Professional Practice

Students must take **either** part-time **or** full-time options

Progression
Completion of 8 Level 1 modules (120 credits) at Level 1 will allow students to progress.

Programme structure/Module map

The course is modular, with 24 modules comprising the programme of study for the BSc (Hons) degree. There are eight modules at each academic level. The nominal length of a module is 56 hours of contact teaching time, although this can vary slightly. Overall, total student learning time for each module is judged to be 150 hours. Each module is worth 15 credits with the exception of the double project module worth 30 credits. The number and level of modules required for each award is shown on p39. The DipHE is the first two years of the BSc programme.

BSc (Hons) Biomedical Science (FT)

Year 1		
Semester 1	S1.5 ICT & Study Skills	S1.6 Laboratory Methods-1
	S1.3 Cell Biology	S1.4 Employment & the
Semester 2	S1.2 Chemistry for Biology	S1.7 Laboratory Methods-2
	S1.1 Anatomy & Physiology	S1.8 Microbial & other causes of
Year 2		
Semester 1	S2.2 Applied Human	S2.5 Cell Physiology &
	S2.3 Biochemistry	S2.9 Pharmacology & Toxicology
Semester 2	S2.7 Molecular Biol &	S2.1 Analytical Techniques &
	S2.4 Biology of Disease	S2.10 Project preparation
Year 3		
Semester 1	S3.8 Molecular Genetics	S3.9 Project*
	S3.5 Clinical Immunology	S3.9 Project*
Semester 2	S3.4 Clinical Biochemistry	S3.3 Cellular Pathology
	S3.6 Haematology & Transfusion	S3.7 Medical Microbiology

BSc (Hons) Applied Biological Science (FT)

Students wishing to take the BSc (Hons) Applied Biological Science (FT) may be offered alternative modules (subject to timetabling restraints/student numbers) as follows:

Year 2: S2.6A Comparative Physiology (for Applied Human Physiology)
S2.8A Nutrition (for Cell Physiology & Immunology or Pharm & Toxicology)
Year 3: S3.1A Biotechnology
S3.2A Cell Communication & Signal Transduction
To be substituted for any level 3 module except Molecular Genetics and Project.

BSc (Hons) Applied Biomedical Science (PT)

	College-based modules	Work-based modules
Year 1		
Semester 1	S1.5 ICT & Study Skills	S1.10WB Workplace Organisation
	S1.3 Cell Biology	
Semester 2	S1.2 Chemistry for Biology	S1.11WB Laboratory Techs &
	S1.1 Anatomy & Physiology	
Year 2		
Semester 1	S2.2 Applied Human Physiology	S1.8 Microbial & other causes of Disease (Distance learning)
	S2.3 Biochemistry	
Semester 2	S2.4 Biology of Disease	S2.9WB Professional practice
	S2.7 Molecular Biology &	
Year 3		
Semester 1	S2.5 Cell Physiology &	S2.11WB Case Study
	S2.9 Pharmacology &	
Semester 2	S3.4 Clinical Biochemistry	S2.10WB Project Preparation
	S3.6 Haematology &	
Year 4		
Semester 1	S3.8 Molecular Genetics	S3.9WB Project *
	S3.5 Clinical Immunology	
Semester 2	S3.3 Cellular Pathology	S3.9WB Project *
	S3.7 Medical Microbiology	

Note: this programme can be taken only if a student is employed in an NHS hospital laboratory approved for training and with the agreed support of the workplace. The academic programme is co-terminus with professional training and competence in the workplace as documented by successful completion of a IBMS training portfolio.

BSc (Hons) Applied Biological Science (PT)

This programme follows the exact same Modul Map as above. However, it is intended for students working in laboratories outside the NHS (e.g. industrial, vetinary, etc). There is no additional requirement for completion of a portfolio. Students wishing to take the BSc (Hons) Applied Biological Science (PT) may be offered alternative modules (subject to timetabling restraints/student numbers) as follows:

Year 2: S2.6A Comparative Physiology (for Applied Human Physiology)
S2.8A Nutrition (for Cell Physiology & Immunology or Pharm & Toxicology)
Year 3: S3.1A Biotechnology
S3.2A Cell Communication & Signal Transduction
To be substituted for any level 3 module except Molecular Genetics and Project.

DipHE Applied Biological Science (FT)

Year 1		
Semester 1	S1.5 ICT & Study Skills	S1.6 Laboratory Methods-1
	S1.3 Cell Biology	S1.4 Employment & the
Semester 2	S1.2 Chemistry for Biology	S1.7 Laboratory Methods-2
	S1.1 Anatomy & Physiology	S1.8 Microbial & other causes of
Year 2		
Semester 1	S2.2 Applied Human	S2.5 Cell Physiology &
	S2.3 Biochemistry	S2.9 Pharmacology & Toxicology
Semester 2	S2.7 Molecular Biol &	S2.1 Analytical Techniques &
	S2.4 Biology of Disease	S2.10 Project preparation

Students wishing to take the DipHE Applied Biological Science (FT) may be offered alternative modules (subject to timetabling restraints/student numbers) as follows:
Year 2: S2.6A Comparative Physiology (for Applied Human Physiology)
S2.8A Nutrition (for Cell Physiology & Immunology or Pharm & Toxicology)

DipHE Applied Biological Science (PT)

Year 1	**College-based modules**	**Work-based modules**
Semester 1	S1.5 ICT & study skills	S1.10WB Workplace organisation
	S1.3 Cell Biology	
Semester 2	S1.2 Chemistry for Biology	S1.11WB Lab Techniques and Statistics
	S1.1 Anatomy & Physiology	

Year 2	College-based	
Semester 1	S2.3 Biochemistry	S1.8 Microbial & other causes of disease
	S2.2 Applied Human Physiology	
Semester 2	S2.7 Molecular Biology & Genetics	S2.9WB Professional Practice
	S2.4 Biology of Disease	
Summer		S2.11WB Case study

Year 3	College-based	Workplace
Semester 1	S2.5 Cell Physiology & Immunology	S2.10WB Project Preparation
	S2.9 Pharmacology & Toxicology	

Note: this programme can be taken only if a student is employed in a laboratory approved for training and with the agreed support of the workplace.

Substitutions for some modules may be offered depending upon student interest and staff availability:

Year 2: S2.6A Comparative Physiology (for Applied Human Physiology);
S2.8A Nutrition (for Cell Physiology & Immunology or Pharm & Toxicology)

Programme awards and Progression

- Certificate of Higher Education: For the award of a Certificate of Higher Education (Cert HE) students must have passed the equivalent of at least 120 credits at level 1 or 105 credits at level 1 and 15 credits at level 2.

- Diploma of Higher Education: For the award of Diploma of Higher Education students must have obtained 120 credits at level 1 and 120 credits at level 2 (or 102 credits at level 1 and 135 credits at level 2) . level 2 modules will be used for calculation of the aggregate mark.

- BSc (Ord) Applied Biological Science: : For the award of a BSc (Ord) Applied Biological Science students must have obtained 120 credits at level 1, 120 credits at level 2, and 60 credits at level 3. Level 2 and level 3 modules will be used for calculation of the aggregate mark.

  The three awards shown above may be made with Distinction for an aggregate mark threshold of 70%, or with Merit for an aggregate mark threshold of 60%.

- BSc (Hons) Biomedical Science: For the award of a BSc (Hons) Biomedical Science students must have obtained 120 credits at level 1, 120 credits at level 2, and 120 credits at level 3 following the IBMS- accredited pathway (i.e. no subsititution of modules)
- BSc (Hons) Applied Biomedical Science: For the award of a BSc (Hons) Biomedical Science students must have obtained 120 credits at level 1, 120 credits at level 2, and 120 credits at level 3 following the IBMS- accredited pathway. This award also requires the successful completion of the IBMS portfolio.
- BSc (Hons) Applied Biological Science: For the award of a BSc (Hons) Applied Biological Science students must have obtained 120 credits at level 1, 120 credits at level 2, and 120 credits at level 3.

  BSc (Hons) degree classifications will be determined using the aggregate mark for modules studies at levels 2 and 3, with a weighting of 30:70 as follows:

First class honours	70%+
Second class honours, division 1	60 – 69%
Second class honours, division 2	50 – 59%
Third class honours	40 – 49%

Students enrolled on one of the BSc programmes will automatically progress from one year (or level) of the programme to the next, provided that they pass all the modules at the lower level. Students originally admitted into one of the DipHE programmes can apply to be transferred to the BSc (Hons) programme at the end of the first semester of their second year. The application will be considered by the course teaching team and will be dependent on their judgement of the applicants' ability to succeed at level 3.