



Criteria and Requirements for the Re-accreditation of BSc (Hons) Degrees in Biomedical Science

September 2021 – July 2022

This document details the requirements for submission of documentation for re-accreditation of undergraduate degree programmes in biomedical science. Separate documents are available for initial accreditation of full undergraduate (bachelor level) honours degrees, and initial accreditation / re-accreditation of postgraduate degrees. The Institute does not accredit Higher National Certificates/Diplomas.

The re-accreditation process will rely on documents being submitted electronically and reviewed by an IBMS-appointed panel, followed by online meetings with representatives of the university, students and employers.

These arrangements will apply equally to UK and non-UK education providers and be in place until July 2022.

For further information about re-accreditation please contact the Education Office (education@ibms.org).

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INTRODUCTION

The Institute of Biomedical Science (henceforth referred to as IBMS) is the professional body for biomedical scientists and has been accrediting biomedical science degree programmes since the 1970's.

IBMS accreditation is a process of peer review and quality enhancement that ensures professional standards of education and training standards, that are suitable for employment in the biomedical science sector under the protected title of Biomedical Scientist. The rationale for seeking IBMS accreditation is therefore for a single academic institution to gain recognition as the provider of a full biomedical science honours level degree programme that is focussed on requirements for statutory regulation of biomedical scientists in the UK, by the Health and Care Professions Council (HCPC).

The IBMS is approved by the HCPC as an education provider. In terms of the IBMS degree accreditation process, this approval is for the following programmes:

- a) Degree followed by the Registration Training Portfolio (Biomedical Science degree) i.e., professional training is completed after graduation.
- b) Degree with the Registration Training Portfolio (Applied Biomedical Science degree) i.e., professional training is completed during the degree programme.

Accreditation is specific to the programme description, which must clearly demonstrate the modules/units contributing to the degree award and their mode of delivery. The degree title should reflect the specific nature of the degree in line with the following:

- a) **Degree followed by the Registration Training Portfolio.** These include:

- Full-time or part-time degree without placement opportunities.
- Full-time or part-time degree, extended to include an optional placement* in an IBMS-approved training laboratory, or a research/industrial laboratory. Completion of the IBMS Registration Training Portfolio (which must be in an IBMS-approved training laboratory) is optional and not a requirement for the degree award.

**This model may take different forms. Where an education provider offers a programme with placement(s) this could be in an IBMS-approved laboratory or other situations where professional work experience can be gained. In these degrees the placement period is still recognised as part of the degree programme and therefore stays within the university responsibility for student welfare and arrangements for the placement. This model does not include students making independent arrangements for work-experience.*

- b) **Degree with the Registration Training Portfolio.** These include

- Full-time or part-time degrees with mandatory placement(s) or work-based learning in a pathology laboratory that has IBMS approval for pre-registration training. The placement/work-based learning is an integral part of the degree, and the education

provider is responsible for ensuring arrangements are in place to enable completion of the IBMS Registration Training Portfolio during the degree. The degree award must enable students to be eligible for the award of the IBMS Certificate of Competence upon graduation, thereby evidencing that graduates are eligible to apply to the HCPC for registration as a biomedical scientist. These degrees may also be approved by the HCPC through a similar process of review against the HCPC standards of education and training (SETS).

To note: This model includes Healthcare Science (Life Science) degrees where students follow discipline-specific pathways in their final year and Apprenticeship degrees (degrees mapped to Healthcare Science Level 6 apprenticeship standards) where students must be in employment. For these degrees, the subject benchmark statement must still be met by all students and is therefore reliant on being achievable through modules that are core to all students, irrespective of the degree pathway.

The IBMS advocates the use of BSc (Hons) in Biomedical Science (not sciences) in the award title for these degrees to denote the profession specific nature of these degrees.

Undergraduate degrees with enhanced research (MSci) will also be considered for accreditation as undergraduate degrees. A programme of biomedical science modules that form an optional pathway within a degree will not be considered for accreditation unless it is a variant of an accredited degree. There is no restriction on students entering year two (or three of a four-year degree) in accordance with university regulations for recognition of prior learning and meet the same standards as full-time students for the degree award.

The accreditation criteria are informed by the HCPC standards of education and training and the Quality Assurance Agency (QAA) Subject Benchmark Statement for Biomedical Sciences (latest edition October 2019).

The curriculum must include all areas of the subject-specific knowledge, understanding and skills of biomedical science related to clinical laboratory subjects as defined in Section 6 of the benchmark statement. These specifically address the knowledge and understanding of disease processes in the context of the study and investigation of those processes. Integration of these subjects will develop a student's professional, evidence-based approach to the causes, diagnosis and treatment of disease (pathobiology or biology of disease).

Following a period of initial accreditation, all programmes are reviewed on a five-year cycle of re-accreditation. This is an opportunity to reflect on course developments, review the accumulation of minor changes and quality enhancements, external drivers and ensure the programme continues to meet the current IBMS criteria for degree accreditation.

SECTION 1: PROGRAMME RE-ACCREDITATION PROCESS

The re-accreditation process and guidance are facilitated through the IBMS Education Office and all communication should be through this route unless otherwise specified.

The Institute will normally appoint a panel of one academic representative and one practitioner representative, in addition to an IBMS education lead to review the submitted documentation and discuss aspects of the proposed programme with representatives of the education provider, employers and students. The Institute may also appoint additional members of the panel for the purpose of training or quality assurance.

Re-accreditation will normally be conducted by document review. Virtual meetings with the programme leader, students and employers may be held if areas need to be explored further.

Re-accreditation reviews will only be considered between October and the end of June to allow for appropriate processes to be completed for student admissions in the following September. Applications for re-accreditation must be received by the end of March at the latest. A single fee is payable to the 'Institute of Biomedical Science' on application for re-accreditation.

Re-accreditation is normally awarded for a period of five years from the time programme accreditation is awarded.

There are three main stages to the re-accreditation process.

STAGE ONE

- 1.1 Once an application has been acknowledged, an IBMS panel will be appointed, and the university notified. Dates for submission of documentation will then be agreed.
- 1.2 Education providers applying for IBMS re-accreditation of their degree programmes are expected to provide detailed submission documents according to the requirements in Section 2 this document.
- 1.3 Documents must be submitted electronically by the agreed date for consideration by the IBMS panel. This is usually a minimum of eight weeks before the scheduled re-accreditation event.
- 1.4 Documents must be relevant to the programme and should focus on the requirements for re-accreditation (detailed in Sections 3 and 4 of this document and the Appendices). Documents should be provided individually in word or pdf format and must be clearly identified in the file title. Pages must be numbered, and the content of the document listed. A descriptive list of documents is provided in section 2 and a checklist in Appendix 3.

STAGE TWO

- 1.5 Following receipt of the documentation the IBMS accreditation panel will confirm that submitted documentation is complete and sufficient to indicate the programme can achieve IBMS re-accreditation, subject to the outcomes of the review. Missing documentation will be requested and must be provided.
- 1.6 If further clarification of the documentation is required an interim report is produced and the education provider will be asked to respond with within four weeks. Following this, a virtual meeting with the Programme Team will be arranged if additional clarification is required.
- 1.7 The panel will produce a final outcome report. Final reports will detail any conditions required for re-accreditation and in addition any recommendations and commendations that have been identified. The report is signed off by the IBMS accreditation panel.

STAGE THREE

- 1.8 The report could have the following outcomes

Outcome 1. Re-accreditation without conditions

The education provider has successfully demonstrated it meets the criteria for re-accreditation.

The Panel may wish to make recommendations that are felt to provide an opportunity to refine or improve the education provider's approach to meeting the IBMS accreditation criteria. A response to recommendations is not required for re-accreditation but it is expected that the programme team will consider them for potential action points. Responses to recommendations should be reflected in subsequent re-accreditation visit documentation.

The Panel may also wish to make commendations for examples of good practice.

The Education Lead provides a summary report of outcomes and a copy of the full review report to the Education and Professional Standards Committee (E&PSC) for approval.

Following committee approval, the education provider is formally notified that the programme has been re-accredited and the re-accreditation certificate awarded. The list of accredited degrees for the IBMS website is updated.

If E&PSC has any concerns these will be discussed with the Education Lead who was lead for the accreditation panel and the Executive Head of Education. The Programme Leader will be contacted through the Education Office and invited to

respond to the concerns. If necessary, a condition for accreditation and time limit for achieving this might be applied.

Outcome 2. Re-accreditation with conditions

The education provider has demonstrated it meets most of the criteria for re-accreditation, but the panel have identified areas where the criteria are not met.

Any conditions are cross-referenced to the re-accreditation criteria and a time limit given for addressing them is identified (usually three months).

The Panel may wish to make recommendations that are felt to provide an opportunity to refine or improve the education provider's approach to meeting the IBMS accreditation criteria. A response to recommendations is not required for re-accreditation but it is expected that the programme team will consider them for potential action points. Responses to recommendations should be reflected in subsequent re-accreditation visit documentation.

The Panel may also wish to make commendations for examples of good practice.

The education provider will be required to respond to the conditions by the set date. Documentation to support the responses will be required with any changes clearly highlighted.

Documentation submitted in response to conditions for accreditation is reviewed electronically with the accreditation panel to confirm conditions have been met or whether further action is required.

Once it has been confirmed that conditions for re-accreditation have been met, the Education Lead provides a summary report of outcomes and a full copy of the review report to the E&PSC for approval. A recommendation will be made to the E&PSC for a period of re-accreditation (usually five years).

If E&PSC has any concerns these will be discussed with the Education Lead who was lead for the accreditation panel and the Executive Head of Education. The Programme Leader will be contacted through the Education Office and invited to respond to the concerns. If necessary, a further condition for accreditation and time limit for achieving this might be applied.

Outcome 3. Re-accreditation declined

In exceptional circumstances the panel may decide that the education provider has failed to demonstrate it meets the majority of criteria for re-accreditation and in addition, from the discussions they have concluded that the education provider has not been able to give sufficient assurance that if conditions were to be set, they could be met in advance of the next academic year.

The panel will identify which re-accreditation criteria have not been met in the outcome report and the reasons for their decision. The panel will not make any recommendations or commendations at this stage.

The Panel has the option to request additional information for review if it decides there is the potential to rectify the situation. The education provider will be given the opportunity to provide this information and once reviewed the Panel will reconvene the process. Alternatively, the education provider may withdraw from the re-accreditation process. This will not prejudice future applications by the education provider for accreditation of the programme.

If the Panel decide the programme is not suitable for re-accreditation and does not have the potential to rectify the situation the Education Lead will provide a summary report of outcomes and a full copy of the review report to the E&PSC for approval.

If E&PSC has any concerns these will be discussed with the Education Lead who was lead for the accreditation panel and the Executive Head of Education.

- 1.9 The education provider will be notified in writing of the Committee decision and their right to appeal. If an appeal is received the appeals process will be followed (see below).
- 1.10 Accredited programmes will be advertised on the Institute's website and the education provider will receive an accreditation certificate for the period of accreditation and permission to use the Institute's Accredited University logo. Only programmes that have current accreditation will be advertised on the Institute's website. The education provider will be expected to provide annual monitoring information when requested by the IBMS (see Appendix 1 Section C for further information).
- 1.11 Failure of the education provider to maintain compliance with the criteria for accreditation will trigger a review by the Institute that may result in withdrawal of the accreditation status of the programme or programmes.
- 1.12 Following a period of initial accreditation all programmes are reviewed on a five-year cycle of re-accreditation. Education providers requiring re-accreditation of their programmes will be contacted by the IBMS at the beginning of the final academic year of their accreditation period.

RIGHT OF APPEAL

Once the education provider has been formally notified of any conditions for accreditation, they have the right of appeal within one month of the re-accreditation final report if they feel the accreditation criteria have not been applied fairly or it is felt the re-accreditation panel has overlooked evidence that the conditions have been met.

Appeals should be put in writing to the IBMS Education Department stating the reasons for the appeal.

Appeals will be reviewed by the Executive Head of Education, Education Lead for the Panel, Chair of the IBMS Education and Professional Standards Committee and the Committee's academic representative.

SECTION 2: DOCUMENTS FOR RE-ACCREDITATION

The re-accreditation review will determine how the programme complies with the IBMS re-accreditation requirements detailed in Sections 3 and 4 of this document. Additional reference information is provided in the appendices.

A key submission is a Self-Reflection Document that provides an evaluation of the student learning experience and student achievement. It is important that the document should reflect on both strengths and weaknesses in the provision based on the quality assurance and monitoring processes and actions arising from these.

The report must be presented under the following headings and where appropriate cross-referenced to supporting documents provided for the re-accreditation process.

- Curriculum design, content and organisation, including any changes since the previous accreditation.
- Teaching, learning and assessment.
- Student progression and achievement, including destinations post-graduation.
- Student support and guidance.
- Learning resources.
- Research.
- Quality management and enhancement.
- Employer/service user engagement.

Supporting evidence to be included:

- Copies of internal annual monitoring reports, including NSS.
- Copies of external examiner reports and responses
- Evidence of student engagement in programme development
- Minutes of employer liaison meetings
- Monitoring of placements (if applicable)

The following list should be used as a checklist for submitting additional updated (current) documentation (available in Appendix 3 as a table to copy and cross-reference sources of information). **Documentation must be submitted as evidence of on-going compliance with the IBMS accreditation requirements.** To assist the Panel all documents must be relevant to the programme, provide evidence to address the requirements of specific criteria, and be easy to navigate for the accreditation panel to find information.

a) Programme specification

The purpose of programme specifications is to act as a definitive record of the course, setting out the course's intended aims and learning outcomes and how these are met. A synopsis of the course for each qualification conferred by the education provider that is being considered for accreditation must be provided. This acts as a reference point for the delivery, assessment, monitoring and review of the programme and should be designed to be shared with academic and support staff, students, internal and external examiners, professional and statutory bodies, and academic reviewers.

Please note the IBMS advocates the use of “Biomedical Science” (not Sciences) as the title for the award. Exit awards should not include this title.

Relevant criteria: 4.1 i), 4.2 i)

b) Course Handbook

This document will serve as the main reference for students, academic staff, University Administrative Office staff and external examiners. It must include the following information some of which will contained in the Programme Specification:

General information: Course title, duration, modes and all named award titles; course aims and learning outcomes; rationale for the design of the programme; external liaison arrangements with employers and the Institute; information on the relevance of the IBMS and HCPC to the programme.

Relevant criteria: Section 3, 4.1, 4.2 ii), 4.3 ii), 4.3 iii), 4.4 iv)

Programme management: Faculty/school support and resources. Infrastructure of teaching and research and relationship with similar courses. Staff development arrangements, including arrangements for external lectures. Quality assurance processes, including a process of external examination.

Relevant criteria: 4.1 i), ii), iii), vi), 4.2 vii) 4.3 iii), 4.4 v) vi)

Admissions requirements: Knowledge and skills; access arrangements; credit transfer; APL; selection procedures; student induction; equal opportunities.

Relevant criteria: 4.4 i), ii), iii), iv)

Assessment: Details of assessment strategies and rationale; schedule of assessment; Assessment Board arrangements; details of penalties for late submission of coursework; approaches to preventing plagiarism. An assessment mapping document should be available which explicitly shows the module name, code and type of assessment.

Relevant criteria: 4.4. i), ii), iii), iv)

Modules: There must be clear descriptions of the modular content of the whole programme and mode of delivery (lectures, practicals, tutorials, flexible learning, summary timetables), including the level and credit points of each component with learning outcomes and methods of assessment. Practical classes / incorporation of laboratory / technical skills and competencies should be evident.

The contents of each individual module must have sufficient detail to indicate the depth and breadth of its contents and indicative reading. Reading lists and other resources for each module must be current and appropriate.

Where university regulations restrict the amount of information in module descriptors a list of the lecture series should be included with a brief synopsis of the content covered.

Relevant criteria: Section 3.1, 3.2, 3.3, 3.4, 3.5, 4.2.iii), iv), viii), v), vi),

QAA Mapping document: To demonstrate where the subject and discipline-specific elements of the QAA subject benchmark statement are covered in individual modules (see Appendix 1 Section E).

Relevant Criteria: section 3.1, 3.2, 3.5

Project arrangements: These should include full details of the project organisation and support available (e.g., supporting lecture programme; amount of supervision available, etc.), information on the production/structure of the dissertation; assessment arrangements, and if applicable funding arrangements, responsibilities of work-based supervisors. A separate project Handbook would be preferred.

Relevant Criteria: section 3.5, 4.4.v)

Placement arrangements (where applicable): A summary must be included in the course handbook to demonstrate students are provided with sufficient information to make informed choices.

Relevant Criteria: 4.5 i, iv, and v) and 4.6 i) to give an overview.

c) Student Handbook (if different from Course Handbook)

The student handbook must provide adequate information regarding relevant regulations and policies, programme content, placement opportunities (if applicable), project arrangements, pastoral care arrangements, student support mechanisms, student representation system, career opportunities and the role of professional and regulatory bodies. Information about membership of the IBMS (www.ibms.org) and registration with the HCPC (www.hcpc-uk.org), and the differentiation of the two, must be clear and accurate with links to the websites.

Relevant criteria: 4.2 ix), 4.4 i) – vii)

d) Placement Handbook (if applicable)

Detailed information must be documented in a Placement Handbook with specific information regarding the responsibilities of students, placement providers and the education provider. Information must include preparation for placements, support and expected outcomes. Where there is completion of the IBMS Registration Training Portfolio, details of responsibilities for training, assessment and the end-point verification must be included.

Relevant criteria: All listed in section 4.5

For integrated placements where completion of the IBMS Registration Training Portfolio is integral to the degree award the placement handbook must contain sufficient information to demonstrate the responsibility of the education provider to ensure the quality of the training, and external verification of the IBMS Registration Training Portfolio, is conducted in accordance with IBMS Guidance and Procedures (available on the IBMS website).

In addition, the education provider must provide:

- a list of all IBMS approved training laboratories they are expecting to use for placement.
- evidence there are structured laboratory training programmes for placement students.
- evidence of processes for external verifier training, laboratory audits and quality assurance of training and portfolio verifications.

Relevant criteria: All listed in section 4.5 plus all listed in section 4.6

e) Short CVs of academic teaching staff

These must also include CVs of external practitioners contributing to the teaching of discipline specific subjects.

These should be in a standardised format and contain only the following information:

- Name and title
- Present post
- Main teaching activities relevant to the programme
- Other activities relevant to the programme e.g., placement co-ordinator/tutor
- Academic qualifications
- Professional qualifications
- Professional membership/involvement (last three years only)
- External professional activities (last three years only)
- Research interests/profile (last three years only)
- Publications (last three years only)
- Other professional development opportunities/support

Relevant criteria: 4.1.v)

f) Employer liaison meeting minutes (with indicative membership)

The Employer Liaison Group (ELG) is expected to have a formal meeting at least one a year, either meeting face to face or on-line (e.g., Zoom, MS Teams).

Relevant criteria: 4.1 iv), 4.3 ii)

SECTION 3: SPECIFIC REQUIREMENTS OF THE PROGRAMME CURRICULUM

Fundamental to the rationale of the course is the integration of the professional knowledge of clinical pathology through a study of a pathobiology component that must consider human disorders and disease processes together with their investigation and contribution to patient care. This material is expected to be included throughout the programme. Discrete modules or an integrated approach would be acceptable, providing its depth and breadth are adequately demonstrated.

Biomedical science students are expected to be able to use and integrate the knowledge of various key subjects to further their understanding of the study, investigation, diagnosis and monitoring of human health and disease and the therapeutic strategies applicable to disease states. IBMS-accredited programmes must reflect a system-led approach that integrates the clinical specialities through underpinning knowledge of biomedical science processes, investigation and treatment used for specific diseases. Biomedical science graduates are aware of the current laboratory methods available for the study, investigation, diagnosis and monitoring of human health and disease in clinical and research environments. This includes an appreciation of the development and evaluation of new and current methods and therapeutic intervention strategies.

If the degree is obtained outside of the UK and the student's first language is not English, the education provider will also need to provide evidence that graduates meet the International English Language Testing System¹ (IELTS) standard level 7 or equivalent.

¹ The International English Language Testing System (IELTS) tests competence in spoken and written English. The HCPC accepts a number of other tests as equivalent to the IELTS examination. Please visit their website (www.hcpc-uk.org) for more information.

It is recognised that education providers of bachelor's degree with honours courses and/or integrated master's degree courses combine, teach and assess the subject matter in different ways and support the development of a wide range of practical skills. However, it is expected that input from employers, particularly those who employ HCPC-registered biomedical scientists in health service laboratories, will make a significant contribution to the review of the curriculum to ensure it remains current to the needs of the regulated profession.

The following sections are reproduced from the QAA subject benchmark statement for Biomedical Sciences (2019). The headings are not intended to imply module titles and the subject matter is not expected to constrain module content.

These areas must be included in the curriculum and adequately assessed. Students must achieve a pass mark in all modules mapped to these subjects as this directly reflects knowledge to practise as a Biomedical Scientist. A mapping document is provided (see Appendix 1 Section E) and must be completed in full to demonstrate where in the programme the underpinning knowledge and subject areas indicated in Sections 3.1 and 3.2 below are included.

Compensation / condonement of modules that cover the clinical laboratory sciences will not be permitted. See 4.2 v).

3.1 Basic knowledge

Human anatomy and physiology

The structure, function, neurological and hormonal control of the human body, its component parts and major systems (musculoskeletal, circulatory, respiratory, digestive, renal, urogenital, nervous, endocrine) and their relationship to each other.

Cell biology

The structure and function of prokaryotic and eukaryotic cells: the cell as the fundamental unit of life; cell division, cell cycle, stem cells, cell specialisation and cooperation.

Biochemistry

Key chemical principles relevant to biological systems, the structure and function of biological molecules, and the biochemistry of processes that support life including cellular metabolism and its control.

Genetics and molecular biology

Genetics, genomics and human variation: the structure and function of genes, the principles of their inheritance, genetic disorders with particular biomedical significance, evolution and population biology. Molecular biology: the structure and function of biologically important molecules including DNA, RNA and proteins, and the molecular events that govern cell function. Molecular biology overlaps with biochemistry, genetics, cell biology and bioinformatics and systems biology, the computation of high volumes of biological data and the properties of a network of interacting components in a system.

Immunology

Immunology: acute and chronic inflammation, structure, function and mechanisms action of the components of the immune system; innate and acquired immunity.

Microbiology

The structure, physiology, biochemistry, identification, classification and control of micro-organisms, including the roles of normal flora.

3.2 Subject-specific knowledge in clinical laboratory specialties

The traditional disciplines of cellular pathology, clinical biochemistry, clinical immunology, haematology, transfusion science, clinical genetics and medical microbiology are increasingly being reconfigured into Blood Science, Cellular Science, Tissue Pathology, Infections and Molecular Science in major pathology service units in the NHS.

However, the subjects below specifically address the knowledge and understanding of disease processes in the context of laboratory investigation:

I. Cellular pathology

Cellular pathology is the microscopic examination of normal and abnormal cells (cytopathology), and tissues (histopathology) for indicators of disease. A biomedical science graduate will have a knowledge of:

- the gross structure and ultrastructure of normal cells and tissues and the structural changes that may occur during disease;
- reproductive science, including infertility and embryology;
- the preparation of cells and tissues for microscopic examination;
- the principles and applications of visualisation and imaging techniques, including microscopy, to aid diagnosis and treatment selection.

II. Clinical biochemistry

Clinical biochemistry is the investigation of the function and dysfunction of systems, organs and tissues by the measurement of biochemical markers.

A biomedical science graduate will have knowledge of:

- the range, and methods used for collection of clinical samples that may be subjected to biochemical analysis
- the principles and applications of biochemical investigations used for screening, diagnosis, treatment and monitoring of disease, including near-patient testing
- therapeutic drug monitoring and investigation of substance abuse.

III. Clinical immunology

Clinical immunology is the study of immunopathological conditions and abnormal immune function. A biomedical science graduate will have a knowledge of:

- the principles of the function and measurement of effectors of the immune response
- the causes and consequences of diseases associated with abnormal immune function, neoplastic diseases and transplantation reactions together with their diagnosis, treatment and monitoring
- principles and practice of immunological techniques used for screening, diagnosis, treatment and monitoring of disease prophylaxis and immunotherapy.

IV. Haematology

Haematology is the study and investigation of the different elements that constitute blood in normal and diseased states. A biomedical science graduate will have a knowledge of:

- the structure, function and production of blood cells
- the regulation of normal haemostasis
- nature and diagnosis of anaemias, haematological malignancies, haemorrhagic and thrombotic diseases
- principles and practice of haematological techniques used for screening, diagnosis, treatment and monitoring of disease.

V. Transfusion science

Transfusion science is the identification of blood group antigens and antibodies that ensures a safe supply of blood and blood components. A biomedical science graduate will have knowledge of:

- the genetics, inheritance, structure and role of red cell antigens
- immune mediated destruction of blood cells
- the preparation, storage and use of blood components
- the selection of appropriate blood components for transfusion and possible adverse effects.

VI. Clinical genetics

Clinical genetics is the identification of genetic mutations and polymorphisms and their influence on disease processes. A biomedical science graduate will have knowledge of:

- genomic, transcriptomic and proteomic methods used to analyse and study human chromosomes and DNA
- the application of molecular biology and bioinformatics in medicine
- pharmacogenetics and personalised medicine
- principles and practice of techniques used for genetic testing for screening, diagnosis, treatment and monitoring of disease and associated ethical issues.

VII. Medical microbiology

Medical microbiology is the study and investigation of pathogenic microorganisms. A biomedical science graduate will have a knowledge of:

- the pathogenic mechanisms of a range of organisms
- public health microbiology
- principles and practice of techniques for screening, diagnosis, treatment and monitoring of a range of infectious diseases, including isolation and identification of microorganisms
- prevention and control of infection, including anti-microbial and anti-viral therapy (including drug resistance).

3.3 Integrated studies

Programmes should contain a reflective, integrated component (pathobiology) in which these clinical laboratory specialties are represented in a system-led approach to the study of disease and its treatment.

3.4 Generic and subject-specific skills

A biomedical science graduate will be aware of the need for compliance with health and safety policies, good laboratory practice, risk and COSHH assessments, the Human Tissue Act, other relevant legislation and the importance of quality control and quality assessment.

There should be early awareness of the IBMS, HCPC and career opportunities, and sufficient links with local employers to provide professional advice to students.

There are a range of skills that a biomedical science graduate will be expected to acquire during the programme of study. These include:

- discipline- and subject-specific skills associated with laboratory practice;
- research skills, including ethics, governance, audit, experimental design, data generation, statistical analysis, literature searching, scientific communication;
- key transferable skills, including communication, IT, numeracy, data analysis.

3.5 Research project

An honours level project based in biomedical science is a mandatory component of an IBMS accredited degree programme. Assessment regulations must require a pass standard to be achieved for the project at honours level that must take the form of an independent project and can be a laboratory-based, a systematic review including statistical analysis and evaluation, or bioinformatics-type project but not a literature review (examples of this are provided in Appendix 2).

The project must be a major piece of assessed work that demonstrates achievement of research skills including:

- research design, methodologies, planning and execution of hypothesis-based research and scientific writing;
- generation, recording, collation and statistical techniques for the analysis of quantitative data and/or qualitative analytical techniques for the interpretation of non-numerical data;
- critical evaluation, problem-solving, use of primary or secondary data to reach a coherent conclusion, and presentation of results.

Accreditation documents must provide details of the following:

- acceptable types of project
- arrangements for students to select a project
- arrangements for student support and supervision
- assessment weighting for different elements of the project
- examples of proposed project titles.

SECTION 4: GENERAL REQUIREMENTS OF THE PROGRAMME

4.1 Management and resources

- i) There should be a clear rationale for the degree programme which clearly supports it as an integral part of the faculty/school with requisite support and resources, which should be sufficient for the projected number of students.
- ii) There should be an infrastructure to support the research and teaching for these students, such as student-staff liaison committees, employers' liaison committees and to support placements, if applicable.
- iii) The education provider should have a clear strategy to provide adequate physical resources to mount or sustain the programme; including computing, information technology, audio-visual equipment, library and laboratory facilities for research and practical classes.
- iv) There must be appropriate input from suitably qualified and experienced biomedical scientists as visiting lecturers to ensure that there is a contribution from the profession for the delivery of the key laboratory specialties. The knowledge of these individuals must be current to the needs of professional practice. Their input should be evidenced through summary CVs that include their teaching commitments.
- v) The relationship of teaching staff to the delivery of modules and research interests should be evidenced in summary CVs.
- vi) There must be a strategy for supporting on-going research and scholarly activities of teaching staff relevant to the programme and the development of students in biomedical science.
- vii) The programme must have regular and effective monitoring and evaluation systems in place.

4.2 Programme delivery

This section may in part be articulated through the programme specification document.

- i) The programme specification must highlight the distinct features of the biomedical science honours degree courses, including title, overall aims and learning outcomes.
- ii) There must be clear descriptions of the modular content and mode of delivery (lectures, practicals, tutorials, flexible learning), including the level and credits of each module, with learning outcomes and methods of assessment. The delivery of subject-specific, transferable and key skills should be evident.

- iii) The contents of each individual module must have sufficient detail to indicate the depth and breadth of its contents and where relevant reflect subject areas in Section 6 of the QAA subject Benchmark Statement for Biomedical Sciences (2019). Reading lists and other resources for each module must be current and relevant.
- iv) Assessment methods should be clearly related to the aims and objectives of the overall programme and its specific components and related learning outcomes. Assessment methods must be varied, authentic and inclusive. The use of formal, closed book examinations and laboratory practical's must be evidenced across the duration of the programme. These should be clearly described with examples in the submission, together with the education provider's policy on assessment. Where on-line assessments have been introduced, details of how these are conducted to ensure academic standards are consistent with previous methods must be provided. If conducted remotely proctoring arrangements must ensure authenticity of the candidates work.
- v) Students must achieve a pass mark in all assessment components for modules that cover the clinical laboratory sciences subject areas. Condonement/compensation will not be permitted for these modules or for any other module(s) that contribute significantly to the benchmark statement and have learning outcomes that students achieve that cannot be evidenced elsewhere.
- vi) Assessment regulations must require a pass mark of 40% to be achieved for the honours project, which must carry at least 20 credits, and take the form of an independent research project. This can be a laboratory or non-laboratory project, but not a 'literature review' (See Appendix 3).
- vii) Central to the process of assessment is the involvement of external examiners with responsibility to ensure that standards are comparable with education providers in the UK who are offering IBMS-accredited biomedical science degree programmes. There must be at least one external examiner from the programme team of an IBMS-accredited degree. Part of the role of the external examiner should be to review registration portfolios from integrated degree students where applicable. This may require the appointment of an additional external examiner who is a registered biomedical scientist. For overseas institutions the external examiner should also be familiar with UK systems and practices.
- viii) Where e-learning forms part of the degree, details will be required on course delivery and modules. Student/tutor and student/student contact time must be clearly defined together with any specific requirements relating to employer support and the use of multimedia communications.
- ix) Where the university offers the opportunity for a credit bearing study year abroad as a Pass/Fail year this will not be considered to contribute to the academic curriculum or part of the accredited degree criteria, other than to clarify the information given to students. Similarly, if part of an international exchange programme it cannot be used to replace any part of the accredited degree.

4.3 Staff- and employer-specific

- i) There should be staff development opportunities for all staff involved in delivering the programme, including visiting lecturers.
- ii) There must be arrangements in place to ensure local stakeholders are involved in the development of the programme and continue to be involved to ensure graduates are fit for purpose with regards to academic requirements for HCPC registration as a biomedical scientist. This should include a formal mechanism (e.g., an Employer Liaison Committee) for the views of employers and local IBMS members to contribute to the design of the programme. (See Appendix 1 Section F).
- iii) There must be a named liaison contact through whom the IBMS can disseminate IBMS information and request annual monitoring information.

4.4 Student Specific

- i) Admission procedures must give both the applicant and the education provider the information they require to make an informed choice about whether to take up the offer of a place on the accredited programme.
- ii) Entry requirements, together with the selection criteria used for interviews and possible exemption arrangements, should be specified and evidence the requirement for a good command of reading, writing and spoken English. Students must be capable of attaining the equivalent to International English Language Testing System (IELTS) standard level 7 at the point of graduation. Universities admitting students from outside the UK will be expected to provide details of how this is confirmed.
- iii) Where there is direct entry after the first year of the programme, there must be a clear policy for assessing students by Accreditation of Prior Learning (APL) to ensure they are able to meet all the learning outcomes in the programme.
- iv) The student handbook must provide adequate information regarding relevant regulations and policies, programme content, placement opportunities (if applicable), and if applicable funding arrangements, responsibilities of work-based supervisors, pastoral care arrangements, student support mechanisms, student representation system, career opportunities and the role of professional and regulatory bodies. Information about membership of the IBMS and awards (e.g., President's Prize), statutory regulation by the HCPC, and the differentiation of the two must be clear and accurate.
- v) Project arrangements should include full details of the project organisation and support available (e.g., supporting lecture programme; amount of supervision available, etc.), information on the production/structure of the dissertation; assessment arrangements. This may be contained in the student handbook or a separate project handbook

- vi) There should be monitoring mechanisms to confirm a student's understanding of policies and procedures and support mechanisms for using them.
- vii) There should be evidence of student feedback mechanisms and engagement with programme development.

4.5 Placement-specific (IBMS registration training portfolio completion is not mandatory)

- i) Some education providers may wish to offer a four-year undergraduate course as part of a bachelor's degree that involves a sandwich-year, normally after the second year of a three-year degree, the third year of a four-year degree. Please note that the IBMS does not stipulate the minimum/maximum number of hours students on a placement are expected to work, or whether students should receive payment. This is dependent on local resources and arrangements agreed with the placement provider. The number of students on placements must be submitted as part of the annual monitoring report.
- ii) The following criteria (iii – ix) apply if there is a placement (work-based learning) opportunity in an IBMS-approved laboratory but the absolute requirement for completion of the IBMS Registration Training Portfolio does not apply, or internship in industry, where professional work experience can be gained. In these degrees the placement period is still recognised as part of the degree programme and therefore stays within the responsibility of the education provider for student welfare and placement support and is recognised in the final degree award title (e.g., degree + work-based experience).

These criteria do not apply if the student takes a break year from their programme and where the education provider does not recognise or contribute to the placement organisation/experience or is completing a part-time degree whilst in employment. In these cases, the accreditation process only recognises the taught academic components and the award title of degree must reflect this.

- iii) The education provider must maintain a thorough and effective system for approving all placements.
- iv) For students undertaking a clinical laboratory (e.g., NHS) placement the laboratory must be approved by the IBMS for pre-registration training, and the placement provider must have an underlying commitment to provide the student with the opportunity to complete all, or part, of the IBMS Registration Training Portfolio. The portfolio is applied for by the training laboratory and provided by the IBMS. It is only valid for completion for the duration of the degree. It does not form part of the degree award.
(Please note: this does not apply to non-UK programmes).
- v) For students undertaking an industrial or academic placement during their studies on the degree programme there must be a formal arrangement between the education

provider and placement provider underlying the commitment to the placement to provide the student with a meaningful experience that is complementary to their degree.

- vi) There must be clear evidence of the collaboration and partnership arrangements between the two organisations, including audit of training standards, monitoring of students and feedback arrangements, and clear lines of responsibility (student, placement provider and education provider).
- vii) There are qualified and experienced staff to deliver student placement education and training and if appropriate the contribution of the placement to the degree award.
- viii) Students and practice placement providers/trainers are fully prepared for placement. A placement handbook should be available for students and employers and must contain the following information:
 - information provided prior to placement
 - timings and the duration of any placement experience
 - intended learning outcomes to be achieved and means of assessment
 - expectations of professional behaviour
 - communication and lines of responsibility/accountability
 - support and monitoring during placement
 - arrangements for completion and external verification of the IBMS Registration Training Portfolio where applicable.
- ix) Learning, teaching and supervision must be designed to encourage safe and effective practice, independent learning and professional behaviour.
- x) The measurement of student performance and progression is an integral part of the wider process of monitoring and evaluation and uses criteria that ensure fairness for all students.
- xi) Professional aspects of practice are integral to the assessment procedures in both the education setting and practice placement.

4.6 Additional requirements for integrated degrees (Applied Biomedical Science, Healthcare Science and Apprenticeship degrees - IBMS registration training portfolio completion is mandatory.)

(Please note this section is does not apply to non-UK programmes that have integrated placements/internships unless students complete the IBMS registration training portfolio).

The following requirements are specific for UK programmes with placements that are integrated into the degree (thereby often referred to as 'integrated degrees') and require completion of the IBMS Registration Training Portfolio for the degree award.

- i) Completion of the IBMS Registration Training Portfolio can only take place in an IBMS-approved training laboratory. It is the responsibility of the university to ensure that

placement laboratories (or employers delivering work-based training for apprenticeship students) have current training approval status (To note: approval status is recorded on the IBMS database system and must be current to the programme being offered).

- ii) The placement/work-based learning provider must have an underlying commitment to provide the student with the opportunity to complete all the IBMS Registration Training Portfolio. The portfolio is provided by the university and forms part of the degree award.
- iii) The portfolio is only valid for the duration of the degree. This must be made clear to students that the portfolio is only valid for the specific degree course that has been accredited by the IBMS.
- iv) Evidence must be provided to demonstrate that the approval status of the laboratory has been independently audited by the education provider and confirmed as having an IBMS-approved training programme and qualified staff to support this for the duration the programme.
- v) A mapping document specific to the programme (i.e., laboratory approval training programme spread sheet) must be provided to demonstrate that those who successfully complete the programme meet all the HCPC standards of proficiency for biomedical scientists through completion of the IBMS Registration Training Portfolio.
- vi) The person responsible (directly or indirectly) for training and assessing students completing the IBMS Registration Training Portfolio must:
 - be a registered biomedical scientist
 - confirm they understand the training and assessment requirements for the IBMS registration portfolio.
- vii) There must be evidence that placement educators and work-based trainers are fully prepared for students completing the Registration Training Portfolio.
- viii) The student must be fully informed about:
 - evidence required for the IBMS registration training portfolio and that this must demonstrate how the HCPC standards of proficiency apply to practice
 - the external verification processes.
- ix) Students must have opportunities to learn with and from, learners from other professions and provide evidence for this in their registration training portfolio.
- x) There must be opportunities for services users and carers to contribute to the learning and development of the student.
- xi) Students must have opportunities to demonstrate and provide evidence of their understanding and application of how the HCPC standards of conduct, performance and ethics apply to their practice.

- xii) A range of learning and teaching methods must be employed throughout the placement to demonstrate the student respects the needs of patients/clients and colleagues.
- xiii) All assessments provide a rigorous and effective process by which compliance with the requirements for completion of the IBMS Registration Training Portfolio for the Certificate of Competence can be measured.
- xiv) Assessment of student portfolios and verification that the HCPC standards of proficiency have been partially met (i.e., further dependent on completion of the degree) must be conducted in accordance with IBMS requirements and by IBMS-approved external verifiers in partnership with the education provider.
- xv) There must be evidence of external verifier training, laboratory audits and quality assurance processes for training and portfolio verifications.

APPENDIX 1: GENERAL INFORMATION

A. Purpose of IBMS accreditation

The aim of professional body accreditation is to ensure that, through a spirit of partnership between the IBMS and Higher Education Institutions (henceforth referred to as education providers), a taught academic qualification at honours degree level is provided that prepares the graduate for suitable employment in the field of biomedical science, with a primary focus on the academic requirements for registration as a biomedical scientist. Although the QAA subject benchmark statement in Biomedical Sciences is referenced, the degrees are defined by the subject specific knowledge and skills Section 6: Biomedical Science. The preferred title for distinguishing IBMS accredited degrees should therefore contain *Biomedical Science* in the singular, and not *biomedical sciences*.

The following is not an exhaustive list but highlights the key purposes of IBMS accreditation.

1. Evidencing the achievement of a benchmark standard of education suitable for statutory regulation with the HCPC.
2. Ensures qualification is fit for purpose for those seeking careers in biomedical science.
3. Promotes the development of specific knowledge and competence that underpins education and training in biomedical science.
4. Ensures curriculum content is both current and anticipatory of future change.
5. Ensures research is embedded in academic teaching and student development.
6. Facilitates peer recognition of education and best practice, and the dissemination of information through education and employer networks.
7. Advances professional practice to benefit healthcare services, patients and professions related to biomedical science.
8. Strengthens links between the professional body, education provider, employer and student.

B. IBMS accreditation and the Health and Care Professions Council

The HCPC is the statutory regulator for biomedical scientists in the UK. An honours degree in biomedical science accredited by the IBMS meets the academic requirement for registration with the HCPC as a biomedical scientist: this being the protected title for an individual who “*analyses specimens from patients to provide data to help doctors diagnose and treat disease*”.

By undertaking a period of laboratory training and completion of the IBMS Registration Training Portfolio for the award of a Certificate of Competence, individuals demonstrate they meet the fitness to practise standards (HCPC standards of proficiency) and are eligible to apply to the HCPC for statutory registration as a biomedical scientist.

In this context it is important to recognise that students must achieve the QAA benchmark descriptors (see Section 3: Specific Requirements of the Programme Curriculum, and Section E below) as this directly reflects the knowledge and understanding required to practise as a Biomedical Scientist (i.e. those within the broad content of clinical laboratory science, (Cellular Pathology and Cytopathology, Clinical Biochemistry, Clinical Genetics, Clinical Immunology, Haematology, Medical Microbiology and Transfusion Science).

The IBMS is approved by the HCPC as an education provider. In terms of the IBMS degree accreditation process, this approval is for the following programmes:

- a) Degree followed by the Registration Training Portfolio (Biomedical Science degree) i.e., professional training is completed after graduation.
- b) Degree with the Registration Training Portfolio (Applied Biomedical Science degree) i.e., professional training is completed during the degree programme.

Accreditation is specific to the programme description, which must clearly demonstrate the modules/units contributing to the degree award and mode of delivery. The degree title should reflect the specific nature of the degree in line with the following:

Degree followed by the Registration Training Portfolio

These include:

- Full-time or part-time degree without placement opportunities.
- Full-time or part-time degree with an optional placement* in an IBMS-approved training laboratory or extended to include a research/industrial laboratory. Completion of the IBMS Registration Training Portfolio (which must be in an IBMS-approved training laboratory) is optional and not a requirement for the degree award.

**This model may take different forms. Where an education provider offers a programme with placement(s) this could be in an IBMS-approved laboratory or other situations where professional work experience can be gained. In these degrees the placement period is still recognised as part of the degree programme and therefore stays within the university responsibility for student welfare and arrangements for the placement.*

Degree with the Registration Training Portfolio

These include:

- Full-time or part-time degrees with mandatory placement(s) or work-based learning in a pathology laboratory that has IBMS approval for pre-registration training. The

placement/work-based learning is an integral part of the degree, and the education provider is responsible for ensuring arrangements are in place to enable completion of the IBMS Registration Training Portfolio during the degree. The degree award must enable students to be eligible for the award of the IBMS Certificate of Competence upon graduation, thereby evidencing that graduates are eligible to apply to the HCPC for registration as a biomedical scientist. These degrees may also be approved by the HCPC through a similar process of review against the HCPC standards of education and training (SETS).

To note: This model includes Healthcare Science (Life Science) degrees where students follow discipline-specific pathways in their final year and Apprenticeship degrees (degrees mapped to Healthcare Science Level 6 apprenticeship standards) where students must be in employment. For these degrees, the subject benchmark statement must still be met by all students and is therefore reliant on being achievable through modules that are core to all students, irrespective of the degree pathway.

C. Awarding and maintaining accreditation

The IBMS will only accredit or re-accredit Biomedical Science and Applied Biomedical Science degrees that incorporate the specific and vocational requirements detailed in the QAA Subject Benchmark Statement for Biomedical Sciences (October 2019) with detailed reference to the core knowledge of biomedical sciences (Section 5 of the statement) and all the subject-specific knowledge of biomedical science (Section 6 of the statement). In the context of accreditation this is equally applicable to non-UK degrees.

While it is acknowledged that it may be desirable to have an element of student choice in a modular degree programme, these QAA requirements inform the core and key subject areas of the accredited degree that must be completed by all students.

Accreditation is normally awarded for a period of five years. The education provider is awarded an accreditation certificate for the named programme(s) and period of accreditation. They also receive formal notification that they can advertise their programme using the IBMS accreditation logo. At the end of this period, the programme is eligible for re-accreditation. One-year extensions to accreditation may be granted if the education provider is undergoing reorganisation change or planning to introduce significant changes, provided it can be demonstrated that the accreditation criteria continue to be met.

Universities are required to identify a university liaison Lead, who is the main point of contact between the university and the Institute.

Changes made to the programme

It is a condition of accreditation that the education provider must notify the IBMS Education Office of any proposed changes that are related to the criteria for accreditation described in this document and would be different from the programme at the time the current period of accreditation was conferred. For example, changes that might affect the delivery and

outcomes of the programme, course title, new pathway, overall aims or changes to academic teaching staff. A clear rationale for the changes must be provided. Proposed changes must ensure the programme continues to meet IBMS accreditation criteria and be approved by the Institute following submission of relevant documentation.

A change form is available on the IBMS website or by request from education@ibms.org and must be completed before the changes are introduced.

Annual Monitoring

The education provider is also required to respond to IBMS requests for annual monitoring information within the timeframe specified and may, from time to time, be expected to provide other information when requested. All information will be treated as confidential. Full details of the annual monitoring process together with a link to an online form are emailed to the university IBMS liaison Lead at the end of the academic year. Failure to complete the annual monitoring will be reported to the Education & Professional Standards Committee and could affect ongoing accreditation.

Failure of the education provider to maintain compliance with the criteria for accreditation and conditions for ongoing accreditation will trigger a review by the IBMS that could result in the accreditation status of the programme, or programmes, being withdrawn.

Re-accreditation

During the final year of student admission, the education provider will be notified that re-accreditation documentation will need to be submitted for review and which can be regarded as an opportunity for periodic review and a quality enhancement of the programme. This is conducted in accordance with the specific and general guidelines appropriate to initial accreditation, with additional requirements. This is all specified in a full re-accreditation document.

A database of accredited programmes is held by the IBMS and updated as contact details or accreditation status changes. The list of accredited programmes is also published on the IBMS website.

For further information about accreditation, please contact the Education Office (education@ibms.org).

D. Students and the IBMS

During their degrees, students are eligible to become an IBMS eStudent member (and receive an online subscription to our monthly magazine *The Biomedical Scientist* and quarterly publication the *British Journal of Biomedical Science*, plus many other benefits. The IBMS offers a group discount to universities wishing to purchase student membership for 10 or more students. Further information can be obtained by emailing subs@ibms.org.

All graduates are eligible to join the IBMS as a Licentiate member.

Each year the President's Prize award can be made by the university to an IBMS eStudent who achieves academic distinction graduating from an IBMS-accredited BSc Honours programme. Applications for the President's Prize must be made on the correct form which is emailed to the university IBMS liaison Lead in the spring of each year. The President's Prize consists of an IBMS diploma, an award of £100.00 and free Licentiate membership for one year. Only one award per university can be made each year and the nominated student must have achieved a first-class honours and be registered as a current member of the Institute by the end of January of their final year of the degree.

E. QAA Benchmark Mapping Template

Please copy this table and complete for circulation with the submission documents

QAA Mapping Template	
Human Anatomy and Physiology	Module (s)
Subject areas should refer to:	
1. Structure, function, neurological and hormonal control of the human body.	
2. Component parts and major systems (cardiovascular, respiratory, digestive, renal, urogenital, nervous and endocrine) and their relationship to each other.	
Biochemistry	Module (s)
Subject areas should refer to:	
1. Key chemical principles relevant to biological systems.	
2. Structure and function of biological molecules (carbohydrates, lipids, proteins).	
3. Biochemistry of processes which support life, including cellular metabolism and its control.	
Cell Biology	Module (s)
Subject areas should refer to:	
1. The structure and function of prokaryotic and eukaryotic cells.	
2. Cell division, cell cycle.	
3. Stem cells, cell specialisation, and cooperation.	
Molecular Biology and Genetics	Module (s)
Subject areas should refer to:	
1. Genetics, genomics and human variation: the structure and function of genes, the principles of their inheritance, genetic disorders with particular biomedical significance, evolution and	

population biology.	
2. The structure and function of biologically important molecules including DNA, RNA and proteins and the molecular events that govern cell function.	
3. Bioinformatics and systems biology.	
Immunology	Module (s)
Subject areas should refer to:	
1. Acute and chronic inflammation.	
2. Structure, function and mechanisms of action of the components of the immune system.	
3. Innate and acquired immunity.	
Microbiology	Module (s)
Subject areas should refer to:	
1. Structure, physiology and biochemistry of microorganisms.	
2. Identification and classification.	
3. Control of microorganisms, including roles of normal flora.	
Subject Specific Knowledge in Clinical Laboratory Specialities	
<i>These specifically address the knowledge and understanding of disease processes in the context of clinical laboratory investigation.</i>	
Cellular Pathology	Module (s)
Requires knowledge of:	
1. the gross structure and ultrastructure of normal cells and tissues and the structural changes which may occur during disease.	
2. reproductive science, including infertility and embryology.	
3. the preparation of tissues and cells (fixation, embedding, microtomy) for microscopic examination.	
4. the principles and applications of visualisation and imaging techniques (including microscopy) to aid diagnosis and treatment.	
Clinical Biochemistry	Module (s)
Requires knowledge of:	
1. the range, and methods used for the collection of, clinical samples that may be subjected to biochemical analysis.	
2. principles and application of biochemical investigations used in screening, diagnosis, treatment and monitoring of disease, including near-patient testing.	
2. therapeutic drug monitoring and investigation of substance	

abuse.	
Clinical Genetics	Module (s)
Requires knowledge of:	
1. Principles of genomic, transcriptomic and proteomic methods used to study human chromosomes and DNA.	
2. The application of molecular biology and bioinformatics in medicine.	
3. Pharmacogenetics and personalised medicine.	
4. Principles and practice of techniques used for genetic testing for screening, diagnosis, treatment and monitoring of disease and associated ethical issues.	
Clinical Immunology	Module (s)
Requires knowledge of:	
1. The principles of the function and measurement of effectors of the immune response.	
2. The causes and consequences of abnormal immune function, neoplastic diseases and transplantation reactions together with their detection, diagnosis, treatment and monitoring.	
3. Principles and practice of immunological techniques used for screening, diagnosis, treatment and monitoring of disease prophylaxis and immunotherapy.	
Haematology	Module (s)
Requires knowledge of:	
1. Structure, function and production of blood cells.	
2. The regulation of normal haemostasis.	
3. Nature and diagnosis of anaemias, haematological malignancies, haemorrhagic and thrombotic diseases.	
4. Principles and practice of haematological techniques used for screening, diagnosis, treatment and monitoring of disease.	
Transfusion Science	Module (s)
Requires knowledge of:	
1. The genetics, inheritance, structure, function and role of red cell antigens.	
2. Immune mediated destruction of blood cells.	
3. The preparation, storage and use of blood components.	
4. The selection of blood components for transfusion and possible adverse effects.	
Medical Microbiology	Module (s)
Requires knowledge of:	
1. The pathogenic mechanisms of a range of microorganisms.	

2. Public health microbiology.	
3. Principles and practice of techniques for screening, diagnosis, treatment and monitoring of a range of infectious diseases, including isolation and identification of microorganisms.	
4. prevention and control of infection, including anti-microbial and anti-viral therapy (including drug resistance).	
Research Skills/Research Project	Module (s)
Candidates should have evidence of a taught module that includes:	
1. Research design, methodologies, planning and execution of hypothesis-based research and scientific writing.	
2. Generation, recording, collation and statistical packages for data analysis.	
3. Critical evaluation, problem-solving, use of primary or secondary data to reach a coherent conclusion, and presentation of results.	

F. University/Employer Liaison

One of the requirements for all education providers seeking IBMS accreditation or re-accreditation of both undergraduate and postgraduate programmes is that there is satisfactory liaison with local employers as a formal mechanism for the views of employers and local Institute members to be taken into consideration in the design etc of the course. Ideally, this would include representation from the local region or branch of the IBMS as this provides a means of enhancing communication between universities, employers and the Institute.

In the context of university/employer liaison employers are seen as professional advisors who are experienced practitioners capable of having input to the development and improvement of courses by advising on subject-specific areas for theoretical knowledge and practical skills that underpin predominately professional training in pathology disciplines. However, not all students seek employment in pathology laboratories and input from employers working in other biomedical science sectors may also be considered desirable, and essential where placement opportunities are being offered. Some of these advisors may have a teaching role on the course on a part time or visiting basis.

The ELG is expected to have a formal meeting at least one a year, either meeting face to face or on-line (e.g., Zoom, MS Teams).

Role of Employer Liaison Group (ELG)

The role of the ELG can apply to single or multiple programmes accredited by the IBMS. Minutes of the meetings should reflect the following roles of the ELG for each programme:

- offer expert advice to the Programme Leader and academic team on the content and relevance of the degree to professional practice in clinical pathology laboratories
- ensure that the delivery and structure of the programmes takes into account the support required from the laboratory (e.g., placements, teaching)
- contribute to the periodic review of degree programmes in line with service requirements and professional/regulatory standards
- advise on new opportunities in biomedical science education that could enhance education and training in biomedical science
- inform the education provider of changing needs relating to service delivery and employment as a biomedical scientist.

Specific to programmes with a work-based placement:

- ensure the students are trained in a supportive environment and fit to practice on graduation
- ensure that the quality of training is provided by reviewing student experience and making recommendations to enhance the quality of this experience.

Membership

The membership of the group should include:

- Chairman (usually the Programme Leader)
- Two -three academic representatives from the programme team for biomedical science
- professional representatives in each discipline from local employers
- local IBMS branch or regional member representative where available

Benefits

The benefits of university/employer liaison committees are to:

- ensure biomedical science practitioners can input to the design of the programmes
- ensure the programmes reflect the professional ethos of biomedical science
- ensure the programme are current to the requirements of biomedical science and its practitioners
- ensure the programmes meet the needs of local employers
- provide useful advice/feedback from prospective employers
- provide laboratory placement and employment opportunities for students and graduates
- enable research strategy to include potential partnerships with employers.

G. External Examiners

Most universities will have a well-established external examiner policy and remit for their duties. The following information is provided as a general overview. The IBMS will expect to see External Examiner reports as part of the documentation for re-accreditation and references to them as part of its annual monitoring process.

Purposes and Functions of the External Examiner System

The External Examiner is involved in the quality assurance processes for a programme throughout the annual cycle, usually for a three- or four-year term of office. During the academic year the External Examiner is sent the draft of the Examination papers to review. Timings being dependent upon the university's academic cycle and processes (i.e whether there are exams after the first and second semester, or just at the end). They are asked to review the examination questions to confirm that they match the learning outcomes of the module and are appropriate for the level (i.e year) of study. They can give feedback and suggest rewording of the questions to ensure a progression of learning standards throughout the programme. The examiner is also an independent view on the questions and can perhaps see where a question could be interpreted several ways and may suggest rewording to ensure clarity.

The primary roles of External Examiners are to ensure:-

- that the standards set for the University's awards and a programme's constituent courses are appropriate by reference to relevant national Subject Benchmark Statements, the National Qualifications Frameworks, the relevant Programme Specification and, where appropriate, the requirements of relevant Professional and Statutory Bodies;
- that the standards of student performance in a programme and its constituent courses are appropriate and comparable with those of other IBMS accredited programmes;
- that the processes for assessment, examination and the determination of awards are sound and have been conducted fairly in accordance with university regulations.

If required, further information is available from education@ibms.org

APPENDIX 2: FINAL YEAR RESEARCH/CAPSTONE PROJECTS

Adapted from "*Choosing your Bioscience Final Year research, Honours or Capstone Project*" guide for students.

Available at: <https://bit.ly/ChoosingBioCapstone>

Laboratory or Fieldwork (possibly undertaken remotely)

BRIEF DESCRIPTION: The aim of these capstones is gain research experience, either in the laboratory or field, and to develop research, experimental and technical skills. In the current circumstances of Covid-19, with restricted access to research facilities, some of this research experience may be gained remotely using simulations, virtual reality or pre-existing data or information.

KEY SKILLS DEVELOPED: Research skills, experimental and technical skills, analytical and numerical skills, experimental design, independent and team-working, planning and organisational skills, resilience.

IDEAL FOR: Careers in scientific or medical research. Careers in analytical or similar laboratories. Careers where knowledge or experience of the research process is required e.g., clinical trials, regulatory affairs, academic medicine, scientific writing.

Big Data and Bioinformatics

BRIEF DESCRIPTION: The aim of these capstones is for you to use existing very large datasets or other sources of information to address research questions relevant to your degree or discipline using bioinformatics, data mining, analysis and visualisation, or similar tools and approaches. These sources of data/information could include large publicly available datasets or information sources or historical data from research groups within your School or Department

KEY SKILLS DEVELOPED: Research skills, experimental design, data mining, analysis and visualisation, numerical and analytical skills, use of large datasets, digital tools and technological skills, critical thinking, planning and organisational skills.

IDEAL FOR: Careers involving the handling, analysis and interpretation of large datasets/information, may be scientific research but could be in other areas e.g., artificial intelligence, policy development, sales and marketing, business development or consultancy. Careers involving the storyboarding or dissemination of information, or the use of digital tools and technologies.

Computer modelling or simulations

BRIEF DESCRIPTION: The aim of these capstones is gain research experience investigating the physiological, pharmacological or biochemical modulation of established models or simulations of body systems, organs or tissues (e.g., intact animals, heart, neurones). For models or simulations used in student education, it could include an evaluation of the scientific accuracy, validity and educational benefits of these.

KEY SKILLS DEVELOPED: Research skills, use of computer models and programmes, analytical and numerical skills, experimental design, independent and team-working, planning and organisational skills.

IDEAL FOR: Careers in scientific or medical research, or education. Careers involving the use of digital tools and technologies. Careers where knowledge or experience of the research process is required e.g., clinical trials, regulatory affairs, academic medicine, scientific writing.

Systematic Review with quantitative data-analysis

BRIEF DESCRIPTION: Systematic reviews are a highly systematic, pre-defined way of undertaking a critical review of the literature or other information. They are used extensively in clinical trials/health care research, and increasingly in other fields. In research, systematic reviews are normally undertaken by a team and therefore they make an ideal team-based capstone, more representative of the real-world. The data analysis aspect of a systematic review may entail formal meta-analysis techniques.

KEY SKILLS DEVELOPED: Research skills, qualitative & quantitative research methods, large datasets, ICT skills, numerical and analytical skills, planning and organisation, team working, leadership.

IDEAL FOR: Careers involving the collation, critical (including numerical or meta) analysis and reporting of large datasets/information (e.g., marketing, business, industry, government) or careers where systematic reviews are used extensively (e.g. clinical trials/health care, policy, social sciences). Careers involving significant scientific, technical or other prescribed formats of writing.

Qualitative Research

BRIEF DESCRIPTION: Qualitative research focuses on in-depth analysis of non-quantitative data. It is used to answer many types of research questions for which quantitative approaches would be inappropriate and contributes to knowledge-generation across a range of medically related fields. Qualitative research classifies data into patterns and themes in order to arrange and conclude results and does not usually employ statistical tools.

Examples include: semi-structured interviews (e.g., of patients or healthcare professionals); structured reviews of internet content (e.g. services offered by stem cell clinics); systematic reviews that explore qualitative themes (e.g. patient or service-user motivations and perspectives); ethical analyses of issues in biomedicine (e.g. ethics of sperm donation or organ transplantation); and systematic reviews of primary qualitative studies.

(Note that 'literature reviews' are not appropriate as projects – qualitative projects must involve the generation of new knowledge.)

KEY SKILLS DEVELOPED: Research skills, qualitative study design, thematic analysis, conceptual analysis, classification/taxonomy construction, theoretical discourse, reflexivity, planning and organisation, team working, leadership.

IDEAL FOR: Careers involving the collation, critical analysis and reporting of qualitative data (e.g., health policy, social science applied to medicine and healthcare, market research); careers where obtaining and analysing views from stakeholders is central (e.g. mediation, patient representation, government); careers involving dealing with philosophical arguments and debates (e.g. public health, medical ethics, civil service).

Stakeholder Opinion

BRIEF DESCRIPTION: The aim of Stakeholder Opinion capstones is for you, either individually or part of a team, to gather relevant stakeholders (e.g., students, employees, identified

sections of the public) opinions on a topic relevant to the Biosciences. This gathering of opinions could be via surveys, focus groups, semi-structured interviews, social media, other means, or a combination of multiple tools.

KEY SKILLS DEVELOPED: Qualitative and quantitative research methodologies and skills, numerical and analytical skills, communication skills, planning and organisation, independent and team working, leadership, resilience, cultural and ethical awareness.

IDEAL FOR: Careers that require interaction and engagement with different sections of the community e.g., social science research, market research, sales and marketing. Careers where you would analyse and use/implement information from stakeholders e.g., sales and marketing, policy development, business, healthcare, consultancy.

Educational Development

BRIEF DESCRIPTION: The aim of Educational Development capstones is for you to create new, or re-purpose existing, educational resources or activities for use in your Schools /Departments undergraduate programmes. It includes evaluation of need and/or the effectiveness of the developed resource or activity. It is NOT a research capstone evaluating educational methodologies/theories or using them as “human participants” in a scientific study. Instead, its principal output is an educational resource.

KEY SKILLS DEVELOPED: Communication skills, creativity, use of initiative, planning and organisational skills, independent working, educational awareness, digital and technological skills

IDEAL FOR: Careers in education, training or professional development, or in the development of educational resources or activities. Careers that require excellent communication skills or involve taking complex information and making it accessible to different audiences (e.g., public)

Team and Multi-team based

BRIEF DESCRIPTION: In the workplace (including scientific research), outputs are usually not the work of a single individual but a team. Graduate employers require employees who are team-players, have significant experience of team-working (on large projects) and though it, have developed leadership skills. Team-based capstones are a much better representation of the workplace than individual capstones, and an ideal opportunity to develop these key skills and graduate attributes. Taking this one stage further, any team comprises of individuals with widely differing knowledge, expertise and skill sets i.e. sub-teams within a team, all contributing to a common goal or output. In research, you will have different research groups collaborating on the same research question e.g. at the molecular, cellular and systems levels. Therefore, we should replicate this in multiteam based capstones, either in research or combining teams undertaking different formats of capstone (e.g. research, stakeholder opinion & public engagement) to collaborate on the same enquiry-based activity.

KEY SKILLS DEVELOPED: Team working, leadership, planning and organisation, emotional intelligence, skills gained via your individual capstone format.

IDEAL FOR: Any careers that involve team-working or leadership roles.

APPENDIX 3: DOCUMENTATION CHECKLIST

Please copy this table and complete for circulation with the submission documents

Accreditation Document and Criteria	Source in document provided (section/page)
<p>Self-Reflection Document</p> <p>The report must be presented under the following headings and where appropriate cross-referenced to supporting documents provided for the re-accreditation process.</p> <ul style="list-style-type: none"> • Curriculum design, content and organisation, including any changes since the previous accreditation. • Teaching, learning and assessment. • Student progression and achievement, including destinations post-graduation. • Student support and guidance. • Learning resources. • Research. • Quality management and enhancement. • Employer/service user engagement. 	
<p>Programme specification (4.1 i), 4.2 i)</p>	
<p>Course Handbook</p>	
<p><u>General information:</u> Course title, duration, modes and all named award titles; course aims and learning outcomes at each stage; rationale for the design of the programme (section 3, 4.1. 4.2ii); external liaison arrangements with employers (4.3.ii) and the Institute (4.3.iii); information on the relevance of the IBMS and HCPC to the programme (4.4. iv),</p>	
<p><u>Programme management:</u> Faculty/school support and resources. Infrastructure of teaching and research and relationship with similar courses. 4.1. i), ii), iii). Staff development arrangements, including arrangements for external lectures. (4.1.vi) Quality assurance processes, including a process of external examination. (4.1.vii, 4.2</p>	

Accreditation Document and Criteria	Source in document provided (section/page)
vii), 4.3 iii), 4.4. v), vi)	
<u>Admissions requirements:</u> Knowledge and skills; access arrangements; credit transfer; APL; selection procedures; student induction; equal opportunities. 4.4. i) - iv)	
<u>Assessment:</u> Details of assessment strategies and rationale; schedule of assessment; Assessment Board arrangements; details of penalties for late submission of coursework; approaches to preventing plagiarism. An assessment mapping document should be available which explicitly shows the module name, code and type of assessment with e.g. word limits. 4.2. iv), v), vi, vii) ,	
<p><u>Modules:</u> There must be clear descriptions of the modular content of the whole programme and mode of delivery (lectures, practicals, tutorials, flexible learning, summary timetables), including the level and credit points of each component with learning outcomes and methods of assessment. Practical classes / incorporation of laboratory / technical skills and competencies should be evident. Section 3.1, 3.2, 3.3, 3.4, 3.5 4.2.iii), iv), viii), v), vi)</p> <p>The contents of each individual module must have sufficient detail to indicate the depth and breadth of its contents and indicative reading. Reading lists and other resources for each module must be current and appropriate. 4.2 iii)</p> <p>Where university regulations restrict the amount of information in module descriptors a list of the lecture series should be included with a brief synopsis of the content covered. Section 2b</p>	

Accreditation Document and Criteria	Source in document provided (section/page)
<u>QAA Mapping document</u> Section 3.1, 3.2 and 3.5	
<u>Project arrangements:</u> These should include full details of the project organisation and support available (e.g. supporting lecture programme; amount of supervision available, etc.), information on the production/structure of the dissertation; assessment arrangements, and if applicable funding arrangements, responsibilities of work-based supervisors. A separate project Handbook would be preferred. Section 3.5, 4.4. v)	
<u>Reference to placements being offered (where applicable):</u> A summary must be included in the course handbook to demonstrate students are provided with sufficient information to make informed choices. For example 4.5 i, iv, and v) and 4.6 i) to give an overview.	
Student Handbook (if different from Course Handbook) 4.2 ix), 4.4. i) – vii)	
Placement Handbook (if applicable) Detailed information must be documented in a Placement Handbook with specific information regarding the responsibilities of students, placement providers and the education provider. Information must include preparation for placements, support and expected outcomes. (All criteria listed in 4.5) Where there is completion of the IBMS Registration Training Portfolio, details of responsibilities for training, assessment and the end-point verification must be included. (In addition to 4.5 all criteria in 4.6)	
Short CVs of academic teaching staff 4.1.v)	
Employer liaison meeting minutes (with indicative membership) 4.1 iv) 4.3 ii)	

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