European Association Biomedical Scientists
Association internationale sans but lucratif

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European Association of Biomedical Scientists

Policy on Education for Biomedical Sciences

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Policy on Education

Contents

1 Background

Biomedical Scientists, also known as Biomedical Laboratory Scientists work in the health services throughout Europe providing a clinical laboratory service. Many of them also work in clinical laboratories in universities and on clinical research projects.
The continued health and wellbeing of our citizens is dependent on having competent scientists in this area.

The EPBS, European Association of Biomedical Scientists, was formed in May 1999 It is committed to promoting best practice and ethics for Biomedical Laboratory Scientists throughout Europe. EPBS is an International Non-Profit Association (AISBL), was first registered under the Belgian law with a Royal Decree in 2006.
Membership is open to national organisations representing Biomedical Scientists.

1.1 Aims of the EPBS:

1. Education and training
   - Setting minimum criteria for the education and training of biomedical scientists in Europe to ensure that all scientists have the knowledge, skills and competence to provide a safe and effective clinical diagnostic laboratory service
   - Promoting the development and access to post graduate programmes leading to specialisation of biomedical scientists in all areas of clinical laboratories to enssure that Europe can respond to the changing healthcare environment
   - Co-operating with teaching establishments offering biomedical science education to achieve EPBS aims
   - Recognising the essential role of continuous professional development (CPD) to quality healthcare, promoting access to CPD programs for all biomedical scientists

2. Public health and patient safety

   - Promoting the essential role of biomedical science in health care systems to the general public
   - Promoting to healthcare stakeholders the essential role of biomedical scientists in delivering quality clinical laboratory diagnostics for the prevention, diagnosis and disease monitoring and in screening programs
   - Providing advice on best practice in the provision of clinical diagnostic services within healthcare organisations and community services

3. Ethics
   - Promoting adherence to the highest ethical standards by European biomedical scientists as outlined in the international code of ethics for biomedical laboratory scientists

4. Political
   - Ensuring the mutual and official recognition in equivalence of standards concerning biomedical science and its harmonisation, in matters of information, procedures, education, training, testing, measurement resources, laboratory standards, quality management and competence, regulation and code of ethics across Europe
   - providing advice, consultation and recommendations on aspects of biomedical science to the European Commission and other relevant European bodies and organisations

- Working with competent authorities to facilitate the 'free movement of the profession' in Europe
- Establishing relationships with active European and international organisations in the field of laboratory medicine
- Promoting the European vision of biomedical science among its members

1.1.1 Members

Austria, Belgium, Croatia, Cyprus, Denmark, Estonia, Finland, France, Germany, Greece, Iceland, Italy, Ireland, Malta, Netherlands, Norway, Portugal, Spain, Switzerland, Sweden, United Kingdom.

2 Education of Biomedical Scientists

The profession of Biomedical Scientists is regulated in different ways in each country with each country having its own academic courses and professional associations.

In furtherance of its objectives the EPBS is taking steps to bring about harmonisation of Education and Training of Biomedical Scientists throughout Europe.
Bearing in mind the Bologna Declaration, the Directive on the recognition of Professional Qualifications and in the best interest of patient safety the EPBS is of the belief that such a qualification level should be the minimum standard required to practice as an independent Registered Biomedical Scientist in Europe.

2.1 Education Current Status

EPBS last reviewed the education status of its member countries in 2006. Following this review, a Policy on Education was established in 2009.

This 2023 review examines the current curriculum, requirement for clinical placement and the duration of study with level of final award. Information and statistics presented have been drawn from responses to the EPBS Survey on Education 2023.

Significant harmonisation has been observed as well as the integration of Biomedical Science education in Higher Education. The majority of EPBS members now have a minimum of 12 years of (elementary and secondary) education prior to entry into Biomedical Science programme at tertiary level.

2.1.1 ECTS European Credit Transfer and Accumulation System

Biomedical Scientist Education was examined on the basis of ECTS. These are presented in Figure 1 below.

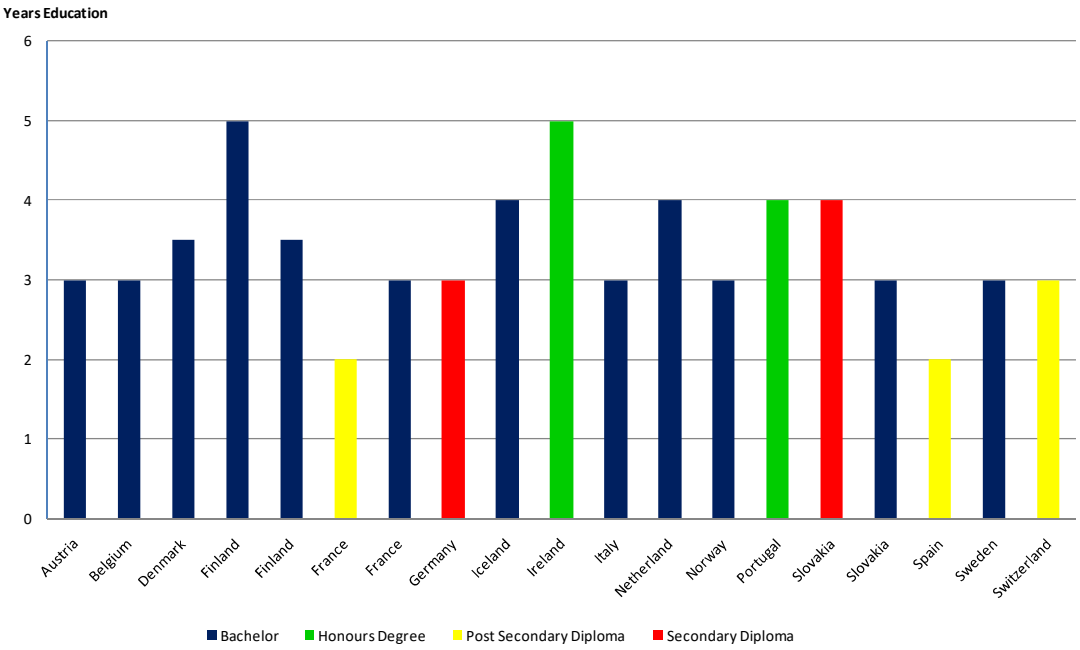
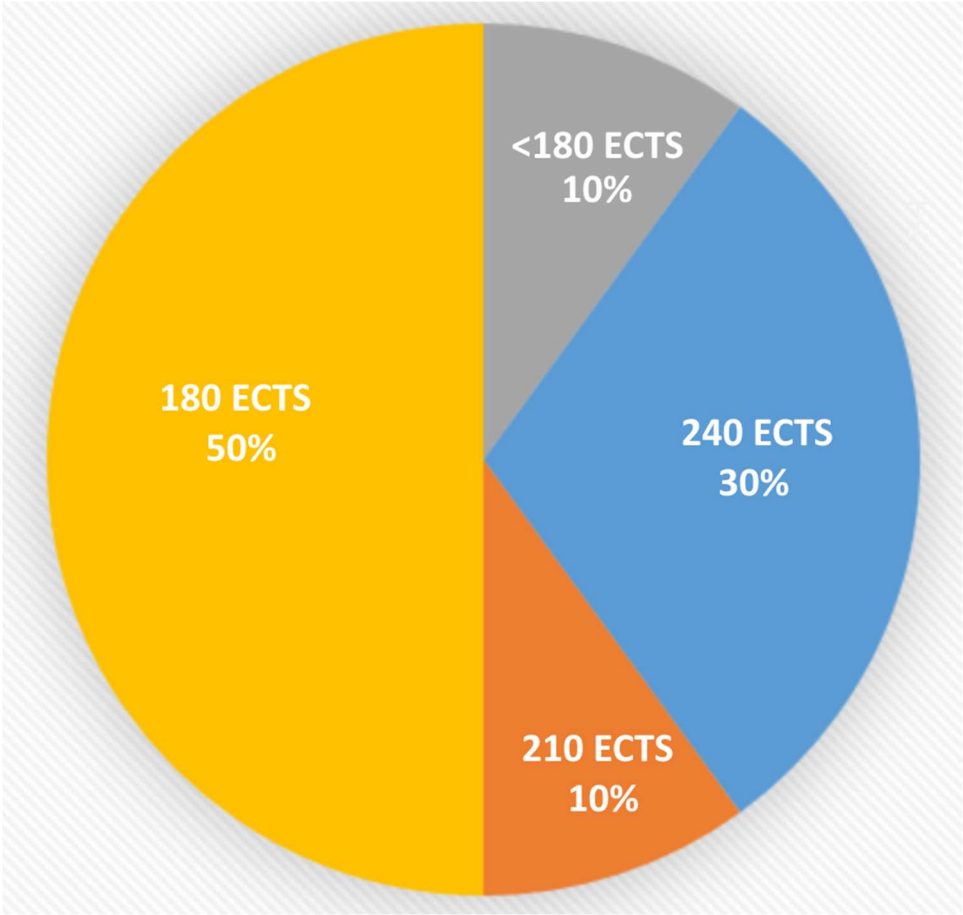


Figure 1 Duration of Education of Biomedical Scientists in European Countries



<180 ECTS	180 ECTS	210 ECTS	240 ECTS
Germany	Austria	Denmark	Greece
Spain	Belgium	Estonia	Iceland
	Croatia		Ireland
	Cyprus		Malta
	France		Portugal
	Italy		Netherlands
	Norway		
	Sweden		
	Switzerland		
	UK		

Figure 3- Distrubution of ECTS in Europe

While some diversity exists, it is clear that the majority of countries have achieved a standard of Bachelor/1st cycle under the Bologna process having courses with a ECTS between 180-240. Since the last review in 2009, only two countries are not at degree level, Germany and Spain.

The survey also revealed that the majority of countries provide opportunities for Biomedical Scientists to achieve higher level degrees to Master's and PhD level.

2.2 Curriculum

Figures 2 - 4 below depict the observed harmonisation in academic courses leading to qualifications in Biomedical Science.

While diversity between standards is observed the core principles of educating Biomedical Scientists through academic theory, clinical practice with problem based learning are maintained.

2.2.1 Basic Sciences

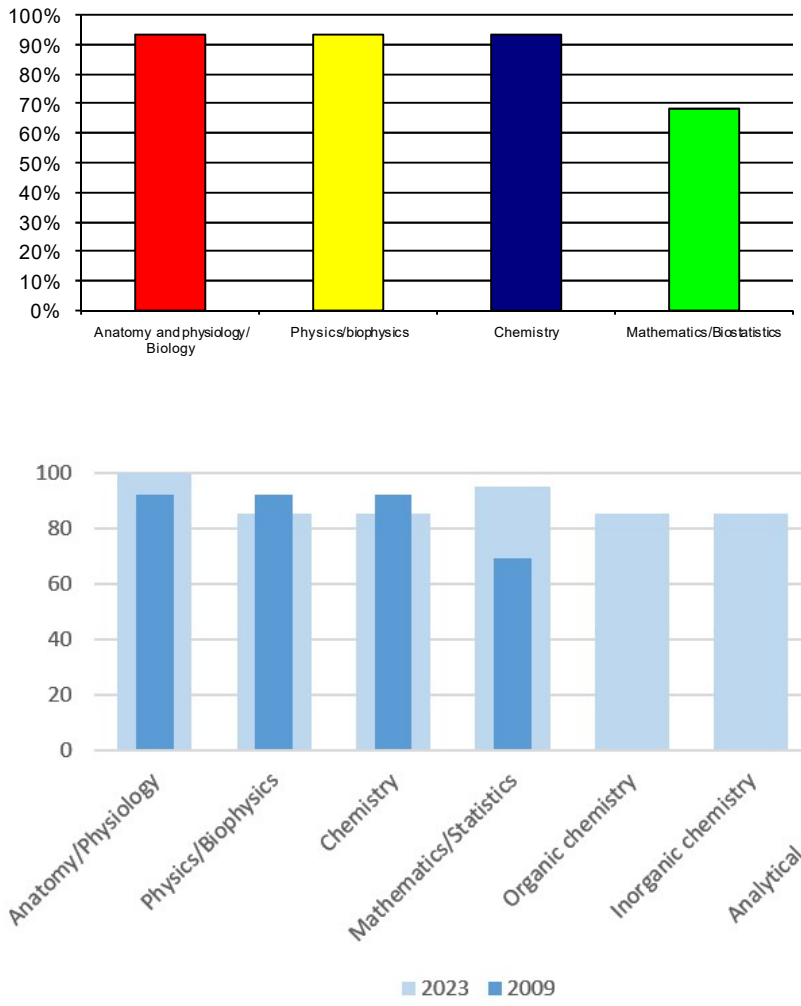


Figure 2 Basic Sciences Studied

Education in the core basic sciences is observed in over 80% of all member countries

2.2.2 Biomedical Sciences

Biomedical Sciences encompasses the common areas of Biochemistry, Haematology, Microbiology, Histopathology and Immunology. Pathophysiology and Molecular Biology are included in the Biomedical Sciences curriculum. In 2009 over 80% of member countries included courses in these areas with the additional subjects of Genetics and Toxicology in over 65%. The level of harmonisation in 2023 has significantly increased. In almost all subject areas there is 100% commonality.
Additionally a large degree of harmonisation is observed in Biomedical Science specialisations.

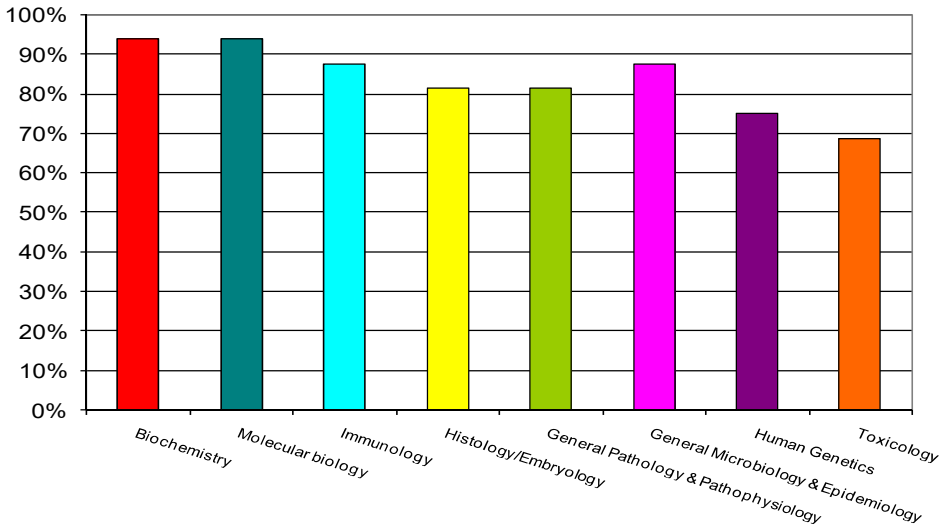
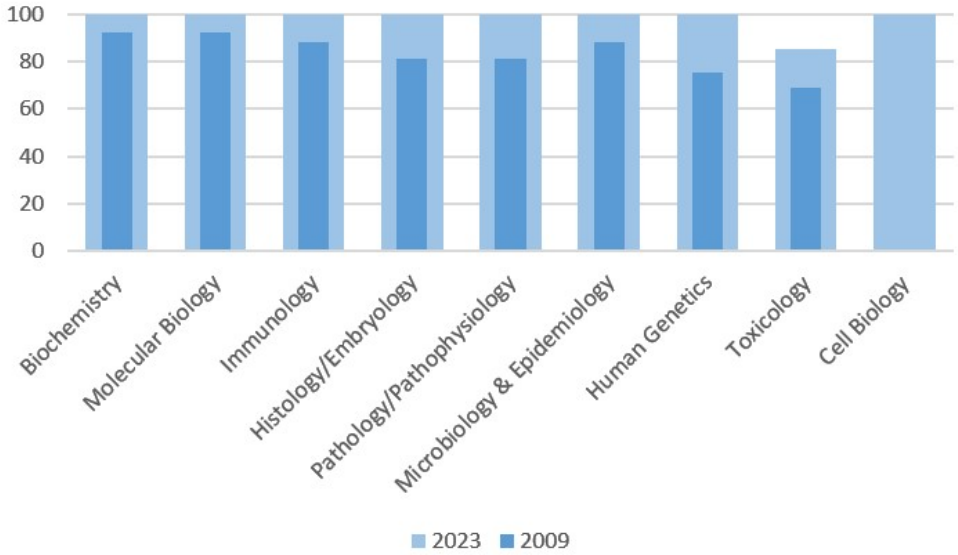


Figure 3 Basic Sciences Studied



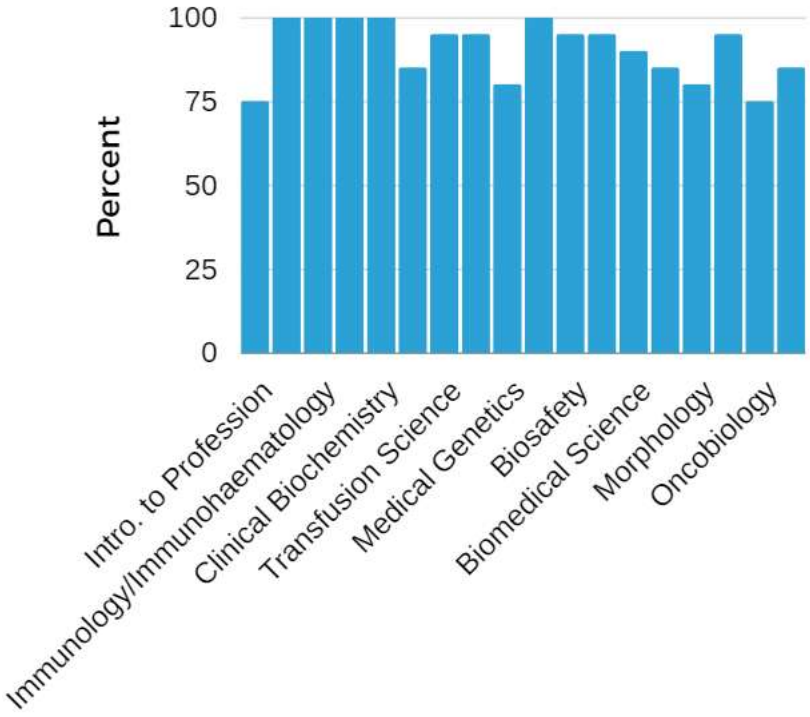
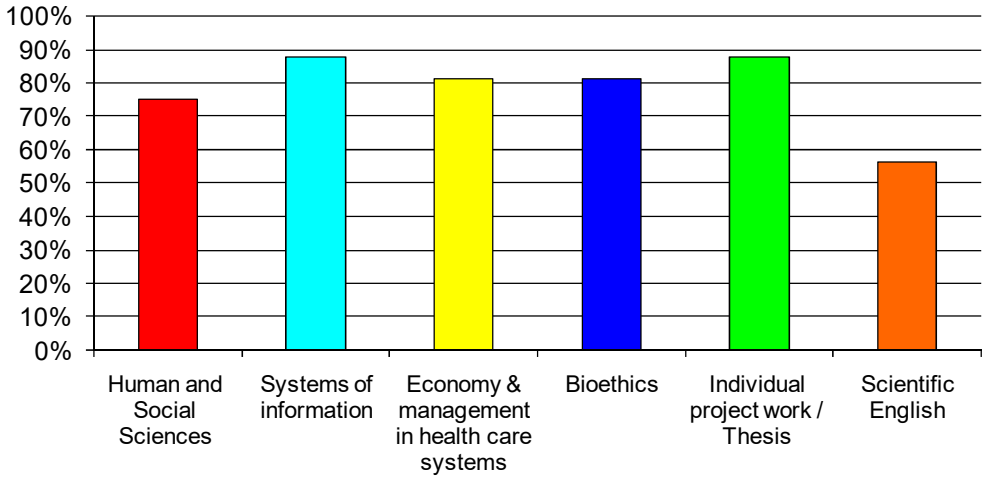

100
75
50
25
0
Percent
Intro. to Profession
Immunology/Immunohaematology
Clinical Biochemistry
Transfusion Science
Medical Genetics
Biosafety
Biomedical Science
Morphology
Oncobiology

Figure 4 Biomedical Science Specialisations

2.2.3 3Complementary Subjects

In addition to basic and biomedical sciences the majority of courses also cover complementary areas such as ethics, information technology and health care management. The data from the 2023 survey is overlaid on previous data gathered and also includes new areas of interest/study. Where English is not the spoken language modules in scientific English may be offered. Almost 90% of the courses include individual project work.



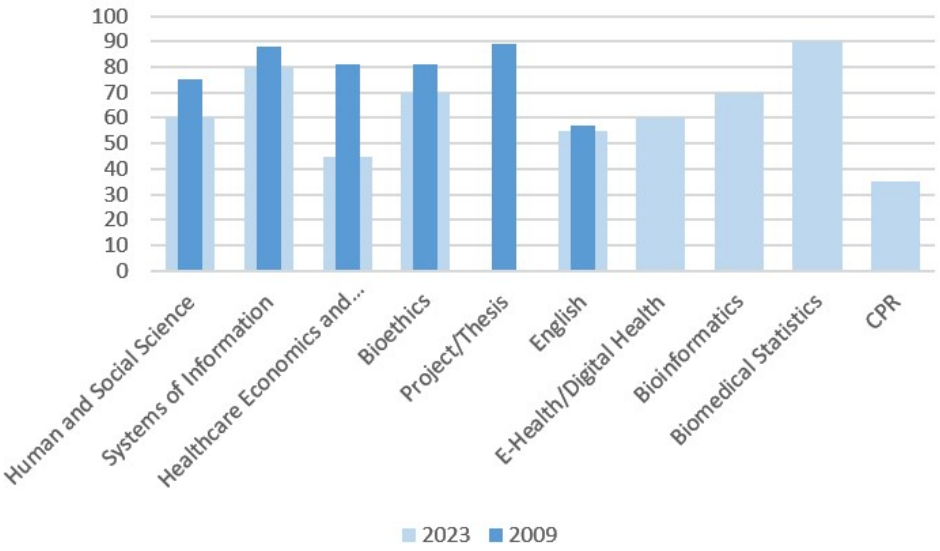


Figure 4 Additional and Complementary Subjects Studied

2.2.4 Clinical Practice

All countries surveyed indicated that their students undertake a period of supervised clinical placement. All students are offered placement in clinical laboratories. Some students have additional opportunities to receive experience in research laboratories and in industry.

3 Recommendations

EPBS recommends that education programmes for Biomedical Scientists should equip graduates to be employed as decision makers in clinical laboratories, research, and industry. The programmes should prepare graduates to participate in leading and developing the clinical laboratory service ensuring patient safety, quality assurance and scientific rigour.

3.1 Course level

The minimum standard of education for Biomedical Scientists acceptable to EPBS is a Bachelor level or 1st cycle under the Bologna Process, level 6 of the European Qualification Framework.

The expected standard is a minimum of 3 years of higher Education (180 ECTS) including supervised clinical practice.

The standard envisaged is a minimum of 4 years of higher Education (240 ECTS) including supervised clinical practice.

3.2 Clinical Placement

Before being registered or licensed for independent practice as Biomedical Scientist candidates should undergo a supervised and assessed clinical placement.

3.3 Minimum Curriculum Knowledge, Skills and Competencies

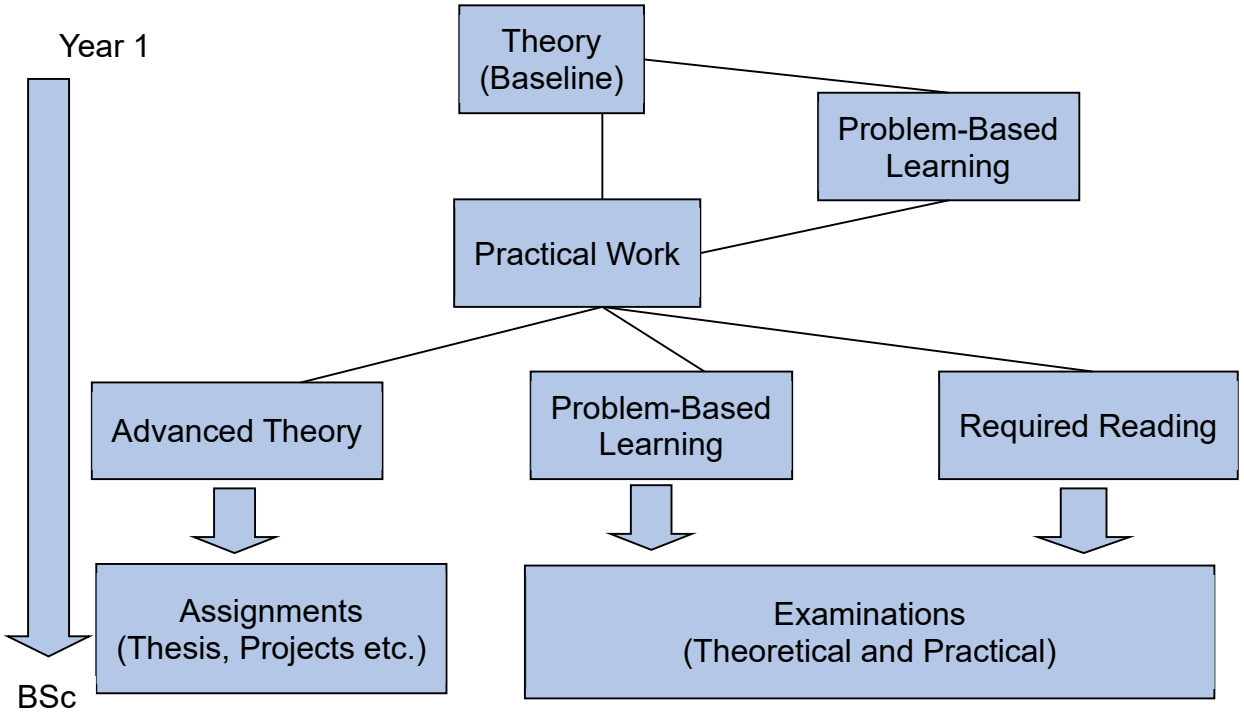
The programme of studies leading to evidence of formal qualifications in biomedical science should be designed in a way that allows the graduates to meet the approved Knowledge, Skills and Competencies approved by EPBS, in its Standards of Proficiency 2023 policy.

The theoretical instruction must be weighted and coordinated with the clinical instruction in such a way that the knowledge and skills required can be acquired in an adequate fashion.

3.4 Course Methodology

The core principles of educating Biomedical Scientists through academic theory and clinical practice should be maintained.

In order to achieve these core principles, all educational tools available currently should be used and developed, for example, e-learning, problem-based learning, team-based learning and any others that become available.



Knowledge
- General
- Scientific (BLS
- Basic Scientific Research Skills-
- Legislation
- Economy/Management
- Validation/Interpretation of Results*
	Technical/Methodological
	- Laboratory methods/Basic principles
	- Organization of lab work
	- Information/Communication technology
	- Awareness of the need for Quality:
	  - Quality control/assurance;
	  - Basic scientific research skills

Social
- Interaction with:
  ○ Patient
  ○ Team (intraprofessional)
  ○ Interprofessional (nurses, physicians)
  ○ Professional partners (companies, org.)
  ○ Relatives (to patient)
	Person
	- Professional identity
	- Role in health care system
	- Lifelong learning
	- Awareness of limits of competence
	- Validation/Interpretation of results*

4 EU Directive on Free Movement of Professionals

The EU Directive on the free movement of professionals defines levels of qualifications and outlines compensation measures permissible.
The EPBS supports the free movement of Biomedical Scientists within the EU and the single market provided that the regulatory requirements in each member country are fulfilled and adhered to.

Where graduates demonstrate adherence to these recommendations, they should be permitted free movement as Biomedical Scientist Professionals throughout Europe.