Programme Specification for the
MSc in Medical Ultrasound / MSc in Medical Ultrasound (Echocardiography)

PLEASE NOTE. This specification provides a concise summary of the main features of the programme and the learning outcomes that a typical student might reasonably be expected to achieve and demonstrate if he/she takes full advantage of the learning opportunities that are provided. This specification provides a source of information for students and prospective students seeking an understanding of the nature of the programme and may be used by the College for review purposes and sent to external examiners. More detailed information on the learning outcomes, content and teaching, learning and assessment methods of each module can be found in the course handbook or on-line]. The accuracy of the information contained in this document is reviewed by the College and may be checked by the Quality Assurance Agency.

1. Awarding Institution: Imperial College London
2. Teaching Institution: Imperial College London
3. External Accreditation by Professional / Statutory Body: N/A
4. Name of Final Award (BEng / BSc / MEng etc): MSc
5. Programme Title (e.g. Biochemistry with Management):
   MSc in Medical Ultrasound / MSc in Medical Ultrasound (Echocardiography)
6. Name of Department / Division: NHLI
7. Name of Faculty: Faculty of Medicine
8. UCAS Code (or other coding system if relevant): N/A
9. Relevant QAA Subject Benchmarking Group(s) and/or other external/internal reference points
   British Society of Echocardiography
10. Level(s) of programme within the Framework for Higher Education Qualifications (FHEQ):
    | Master's (MSc, MRes) | Level 7 |
11. Mode of Study

1 MSc in Medical Ultrasound / MSc in Medical Ultrasound (Echocardiography)
12. Language of Study: English

13. Date of production / revision of this programme specification (Month/Year):

November 2009

14. Educational aims/objectives of the programme

The programme aims/objectives are to:

The aims of the course are:

- To attract highly motivated and appropriately qualified students
- To provide students with intensive training in both the theoretical basis of medical ultrasound
- To aid students to develop the required scanning and diagnostic skills in the specialised disciplines of echocardiography and vascular ultrasound.
- To provide students with the clinical understanding and knowledge of disease required to used these skills optimally in their future careers
- To provide students with intensive research training and the opportunity to make an original contribution to their chosen area of research specifically to develop their skills in the following areas
  - Literature searching and critical appraisal
  - Experimental design
  - Data analysis
  - Written scientific communication;
- To provide a solid foundation for those who chose to go to further study

15. Programme Learning Outcomes

1. Knowledge and Understanding

At the end of the programme the student will possess

FOR ALL PATHWAYS
  a) Knowledge and understanding of the physical principles and clinical use of imaging including data recording and retrieval

PART II: ECHOCARDIOGRAPHY
  b) The ability to generate, store and display images
  c) Knowledge and understanding of thoracic and cardiac basic anatomy and physiology and the aetiology, pathophysiology, diagnosis and treatment of heart disease as relevant to echocardiography.
  d) Knowledge and understanding of advanced aetiology, pathophysiology, diagnosis and treatment of heart disease as relevant to echocardiography.

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e) Knowledge and understanding of the structural and functional assessment of the normal and abnormal paediatric heart

f) Specialised topics

**PART II: VASCULAR ULTRASOUND**

g) Knowledge and understanding of vascular anatomy, physiology, pathophysiology and haemodynamics and angiography

h) Knowledge and understanding of advanced Doppler techniques and their applications to the diagnosis of vascular disease

2. Skills and other Attributes

**Intellectual Skills**

a) Capacity to formulate hypotheses,
b) Ability to perform and interpret basic statistical analyses,
c) Ability to evaluate published research
d) Ability to abstract data
e) Ability to design, execute, analyse and write up novel research

a) - d) are taught largely through lectures and seminars, directed and self-directed study problem solving and experimental design

e) is taught through the medium of the original research project

**Practical Skills**

a) The ability to perform a comprehensive echo-, vascular ultrasound analysis as appropriate to specialisation selected

b) The research skills required to successfully plan, execute and write up a novel research project

a) is taught via laboratory, clinical and private study, and work-based learning,
b) is taught via the project:

**Transferable Skills**

a) Self management including planning, prioritisation, timekeeping
b) Capacity to work independently and as part of a team
c) Ability to reflect and refine own practice
d) Ability to keep comprehensive and accurate records

a) – d) are taught via laboratory, clinical and work-based study and via the medium of the project

16. The following reference points were used in creating this programme specification

For Echocardiography option, the British Society of Echocardiography

For all options, the course handbook

17. Programme structure and features, curriculum units (modules), ECTS assignment and award requirements

Clinical placements may be taken at the Hammersmith Hospital or the student’s home institution

**Year One:**

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Term one:
- Placement within relevant clinical department.
- Physics lectures undertaken.
- Development of dissertation
- Begin clinical patient log book

Term Two:
- Continue clinical placement
- Speciality lectures undertaken
- Continue development of dissertation
- Continue development of clinical patient log book

Term Three:
- Continue clinical placement
- Complete written exams
  - Paper 1 Physics 3 h written
  - Paper 2 Speciality 3 h written
- Complete clinical examination
- Complete clinical log book
- Complete dissertation
- Attend Board of Examiners meeting for Viva.

ECTS allocation
Element One  20 ECTS
- Paper 1
- Paper 2
- Speciality coursework

Element Two  38 ECTS
- Clinical examination
- Clinical log book
- Diagnostic reporting

Element Three  32 ECTS
- Thesis
- Viva

Year Two (if applicable): - Only relevant to Vascular

Term one:
- Continue clinical placement
- Continue development of dissertation
- Continue development of clinical patient log book

Term Two:
- Continue clinical placement
- Continue development of dissertation
- Continue development of clinical patient log book

Term Three:
• Continue clinical placement
• Complete practical examination
• Complete dissertation
• Complete patient log book
• Attend Board of Examiners meeting for Viva.

ECTS allocation as above

18. Support provided to students to assist learning (including collaborative students, where appropriate).

Students receive a departmental induction which covers the course handbook, examinations and what is expected from the student during their academic year. Students are supported by the course director, course tutor for their speciality and supervisors in their department. Students have access to libraries on the college’s various campuses and an extensive patient database of clinical material on a wide spectrum of pathology. English language support is available if required. All students have a personal tutor and access to the Imperial College Welfare services and Student Counsellors.

19. Criteria for admission:

Applicants will require an Honours degree with a minimum grade of Lower Second (or equivalent) in medicine or a biological, engineering, physical science subject. Candidates with a degree in medicine will be eligible for consideration without experience. Candidates with a degree in another science subject must demonstrate relevant experience. Candidates with three years of work experience but without a degree may be considered, subject to a special qualifying examination. Candidates with a medical background should note that GMC registration is not required for the course. Participants will be classified as ‘postgraduate students’ and will work under the supervision of qualified staff. The treatment of patients remains the responsibility of hospital staff at all times. Students registering for the part-time course must be working at least three days per week in an ultrasound clinic for the duration of the course.

20. Processes used to select students:

Applicants submit their CV and those meeting the minimum academic requirements are interviewed by the course director. Places are offered on the basics of academic achievement and prior experience.

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

a) Methods for review and evaluation of teaching, learning, assessment, the curriculum and outcome standards:

The external examiner system and Boards of Examiners are central to the process by which the College monitors the reliability and validity of its assessment procedures and academic standards. Boards of Examiners comment on the assessment procedures within the College and may suggest improvements for action by relevant departmental teaching Committees.

The Faculty Studies Committees and the Graduate Schools’ Postgraduate Quality Committees review and consider the reports of external examiners and accrediting bodies and conduct periodic (normally quinquennial) and internal reviews of teaching provision.
Regular reviews ensure that there is opportunity to highlight examples of good practice and ensure that recommendations for improvement can be made.

At programme level, the Head of Department/Division has overall responsibility for academic standards and the quality of the educational experience delivered within the department or division.

Most of the College’s undergraduate programmes are accredited by professional engineering and science bodies or by the General Medical Council. Accreditation provides the College with additional assurance that its programmes are of an appropriate standard and relevant to the requirement of industry and the professions. Some postgraduate taught courses are also accredited.

b) Committees with responsibility for monitoring and evaluating quality and standards:

The Senate oversees the quality assurance and regulation of degrees offered by the College. It is charged with promoting the academic work of the College, both in teaching and research, and with regulating and supervising the education and discipline of the students of the College. It has responsibility for approval of changes to the Academic Regulations, major changes to degree programmes and approval of new programmes.

The Quality Assurance Advisory Committee (QAAC) is the main forum for discussion of QA policy and the regulation of degree programmes at College level. QAAC develops and advises the Senate on the implementation of codes of practice and procedures relating to quality assurance and audit of quality and arrangements necessary to ensure compliance with national and international standards. QAAC also considers amendments to the Academic Regulations before making recommendations for change to the Senate. It also maintains an overview of the statistics on completion rates, withdrawals, examination irregularities (including cases of plagiarism), student appeals and disciplinaries.

The Faculty Studies Committees and Graduate School Postgraduate Quality Committees are the major vehicle for the quality assurance of undergraduate / postgraduate courses respectively. Their remit includes: setting the standards and framework, and overseeing the processes of quality assurance, for the areas within their remit; monitoring the provision and quality of e-learning; undertaking reviews of new and existing courses; noting minor changes in existing programme curricula approved by Departments; approving new modules, changes in module titles, major changes in examination structure and programme specifications for existing programmes; and reviewing proposals for new programmes, and the discontinuation of existing programmes, and making recommendations to Senate as appropriate.

The Faculty Teaching Committees maintain and develop teaching strategies and promote inter-departmental and inter-faculty teaching activities to enhance the efficiency of teaching within Faculties. They also identify and disseminate examples of good practice in teaching.

Departmental Teaching Committees have responsibility for the approval of minor changes to course curricula and examination structures and approve arrangements for course work. They also consider the details of entrance requirements and determine departmental postgraduate student numbers. The Faculty Studies Committees and the Graduate School Postgraduate Quality Committees receive regular reports from the Departmental Teaching Committees.
c) Mechanisms for providing prompt feedback to students on their performance in course work and examinations and processes for monitoring that these named processes are effective:

Students receive daily direct supervision with immediate feedback on their clinical performance. Meeting are held between student and supervisor on at least monthly basis in order to provide feedback on project work and dissertation. Additional meetings will be organised for any student requiring more support. Weekly meetings are held between staff and students for review of progress and these provide students with opportunities to raise any problems.

d) Mechanisms for gaining student feedback on the quality of teaching and their learning experience and how students are provided with feedback as to actions taken as a result of their comments:

Students are invited to complete questionnaires on the course and the quality of the teaching but completion of these is optional. Dialogue via staff-student committees permits the exchange of views in both directions. Students often give feedback during their weekly monitoring sessions. Student performance in assessments provides an objective measure of teaching quality.

e) Mechanisms for monitoring the effectiveness of the personal tutoring system:

Staff-student committees, Divisional Postgraduate (Taught Course) Committee

f) Mechanisms for recognising and rewarding excellence in teaching and in pastoral care:

Staff are encouraged to reflect on their teaching, in order to introduce enhancements and develop innovative teaching methods. Each year College awards are presented to academic staff for outstanding contributions to teaching, pastoral care or research supervision. A special award for Teaching Innovation, available each year, is presented to a member of staff who has demonstrated an original and innovative approach to teaching. Nominations for these awards come from across the College and students are invited both to nominate staff and to sit on the deciding panels.

g) Staff development priorities for this programme include:

To obtain honorary lectureships for all key teachers on this course
To encourage all permanent staff to take the MSc course themselves
To encourage staff to take advantage of relevant college training opportunities

22. Regulation of Assessment

http://www3.imperial.ac.uk/registry/information/academicregulations

a) Assessment Rules and Degree Classification:

For postgraduate taught programmes: The Pass Mark for postgraduate taught courses is 50%. In order to be awarded a result of pass candidates must obtain 50% in each element. In order to be awarded a merit, a candidate must obtain a mark of 60% or greater in each element; a result of distinction requires a mark of 70% or greater in each element.

Where appropriate, a Board of Examiners may award a result of merit where a candidate has achieved a mark of 60% or greater across the programme as a whole AND has obtained a mark of 60% or greater in each element with the exception of one element AND has
obtained a mark of 50% or greater in this latter element.

Where appropriate, a Board of Examiners may award a result of distinction where a candidate has achieved an aggregate mark of 70% or greater across the programme as a whole AND has obtained a mark of 70% or greater in each element with the exception of one element AND has obtained a mark of 60% or greater in this latter element.

b) **Marking Schemes for undergraduate and postgraduate taught programmes:**

The Pass Mark for all postgraduate taught course modules is 50%. Students must pass all elements in order to be awarded a degree.

c) **Processes for dealing with mitigating circumstances:**

For postgraduate taught programmes: A candidate for a Master’s degree who is prevented owing to illness or the death of a near relative or other cause judged sufficient by the Graduate Schools from completing at the normal time the examination or Part of the examination for which he/she has entered may, at the discretion of the Examiners,

(a) Enter the examination in those elements in which he/she was not able to be examined on the next occasion when the examination is held in order to complete the examination,

or

(b) be set a special examination in those elements of the examination missed as soon as possible and/or be permitted to submit any work prescribed (e.g. report) at a date specified by the Board of Examiners concerned. The special examination shall be in the same format as specified in the course regulations for the element(s) missed.

Applications, which must be accompanied by a medical certificate or other statement of the grounds on which the application is made, shall be submitted to the Academic Registrar who will submit them to the Board of Examiners.

d) **Processes for determining degree classification for borderline candidates:**

For postgraduate taught programmes: Candidates should only be considered for promotion to pass, merit or distinction if their aggregate mark is within 2.5% of the relevant borderline. Nevertheless, candidates whom the Board deems to have exceptional circumstances may be considered for promotion even if their aggregate mark is more than 2.5% from the borderline. In such cases the necessary extra marks should be credited to bring the candidate’s aggregate mark into the higher range.

e) **Role of external examiners:**

The primary duty of external examiners is to ensure that the degrees awarded by the College are consistent with that of the national university system. External examiners are also responsible for approval of draft question papers, assessment of examination scripts, projects and coursework (where appropriate) and in some cases will attend *viva voce* and clinical examinations. Although external examiners do not have power of veto their views carry considerable weight and will be treated accordingly. External examiners are required to attend each meeting of the Board of Examiners where recommendations on the results of individual examinations are considered. External examiners are required to write an annual report to the Rector of Imperial College which may include observations on teaching, course structure and course content as well as the examination process as a whole. The College provides feedback to external examiners in response to recommendations made within their reports.
23. Indicators of Quality and Standards

24. Key sources of information about the programme can be found in http://www1.imperial.ac.uk/medicine/teaching/postgraduate/clinicalmastersmsc/medicalultrasound/