

**PROGRAMME APPROVAL FORM
SECTION 1 – THE PROGRAMME SPECIFICATION**

1. Programme title and designation		Clinical Sciences (Medical Physics)		
		For undergraduate programmes only		
		Single honours	Joint	Major/minor
		<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
2. Final award				
Award	Title	Credit value	ECTS equivalent	Any special criteria
MSc	Clinical Sciences (Medical Physics)	180	90	N/A
3. Nested award				
Award	Title	Credit value	ECTS equivalent	Any special criteria
N/A	N/A	N/A	N/A	N/A
4. Exit award				
Award	Title	Credit value	ECTS equivalent	Any special criteria
PgDip	Clinical Engineering	120	60	N/A
PgCert	Clinical Engineering	60	30	N/A
5. Level in the qualifications framework				
6. Attendance				
		Full-time	Part-time	Distance learning
Mode of attendance			✓	
Minimum length of programme			2 years	
Maximum length of programme			5 years	

7. Awarding institution/body	King's College London
8. Teaching institution	King's College London
9. Proposing department	Division of Imaging Sciences and Biomedical Engineering, Dept Medical Engineering and Physics
10. Programme organiser and contact Details	Dr Slavik Tabakov Slavik.tabakov@kcl.ac.uk Tel/fax: 020 3299 3536
11. UCAS code (if appropriate)	N/A
12. Relevant QAA subject benchmark/ Professional, statutory and regulatory body guidelines	N/A
13. Date of production of specification	This programme is based on MSc Medical Engineering and Physics, its specifications:

	original: 2002/3 Updated for CF: 2006/7 Revision 2011
14. Date of programme review	2011/12

15. Educational aims of the programme

i.e what is the purpose of the programme and general statements about the learning that takes place over the duration of the programme

1. To provide students, irrespective of age, sex, race or creed with a thorough grounding across the field of clinical engineering and to enable the student to integrate and apply this knowledge to clinical problems.
2. To provide the student with the widest and most cohesive programme of learning opportunity relevant to the field, consistent with quality.
3. To facilitate the development of an awareness of the clinical activities which can benefit from an input from the professional medical physicist.
4. To facilitate the development in each student of the skills of critical analysis and evaluation.
5. To equip the student with the knowledge and skills required to participate actively in research and development and to provide a vehicle for those seeking an educational foundation for PhD studies.
6. To provide students with the means for prosecuting Continuing Professional Development.

16. Educational objectives of the programme/programme outcomes (as relevant to the SEEC Credit Level Descriptors)

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

Knowledge and understanding

The programme provides a **knowledge and understanding** of the following:

1. Underlying principles of wide range of technologies applied in medicine.
2. Fundamentals of the structure and principal functional systems of the body.
3. Fundamentals of computing principles, signal processing and statistical techniques and analysis relevant to medical data.
4. Fundamentals of radiation physics required for medical imaging and radiation therapy.
5. Dose measurement, calibration, QA, treatment planning and radiobiology.
6. Physics of, and equipment for: Magnetic resonance, Ultrasound, X-Ray, Nuclear Medicine other Imaging modalities and Radiotherapy.
7. Principles of radiation safety in medicine.
8. Computational methods for image/data processing

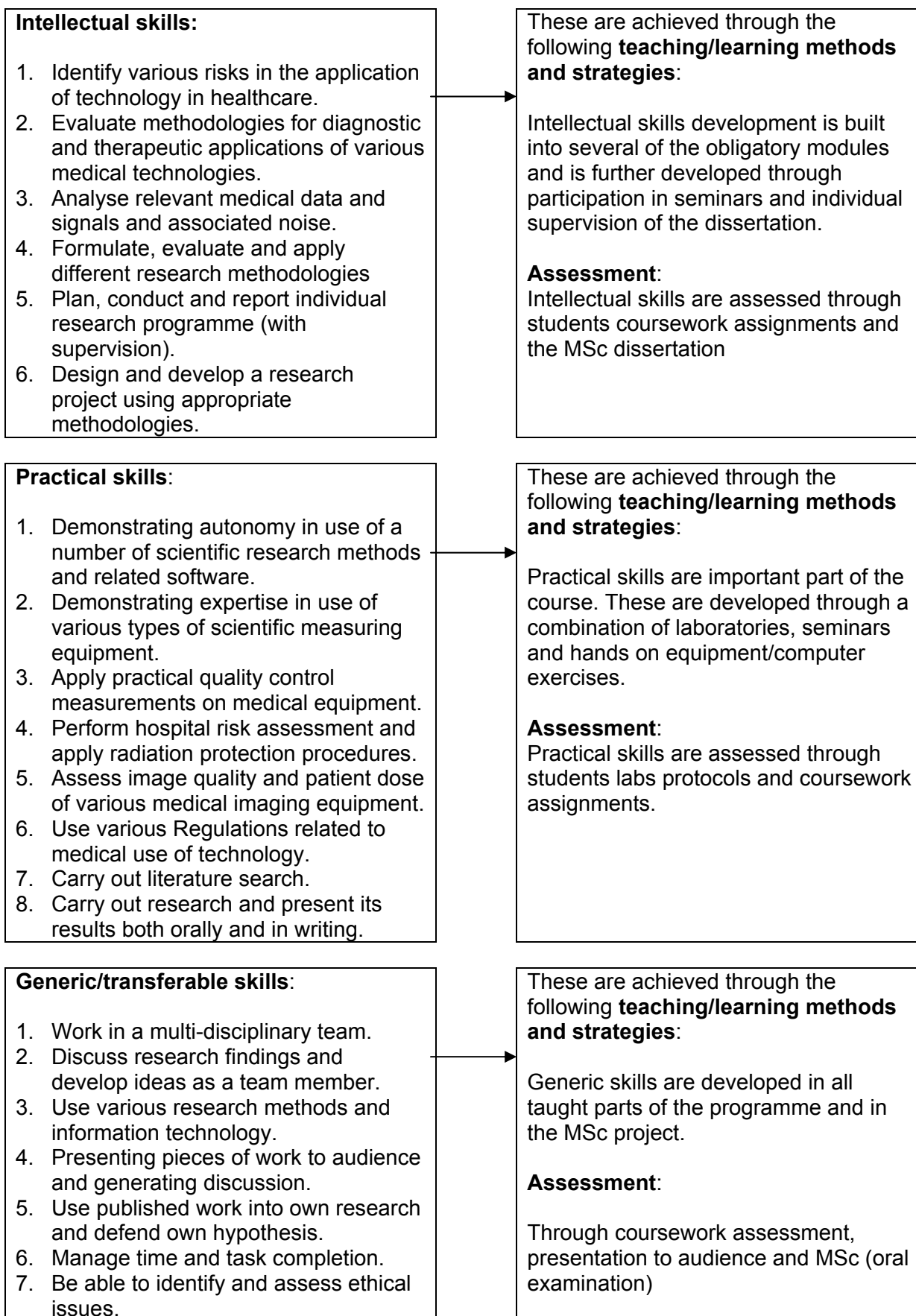
These are achieved through the following **teaching/learning methods and strategies**:

Formal lectures, laboratories, seminars and self-learning, all organised on modular principal

Assessment:

Written examinations, coursework assignments, and a dissertation

Skills and other attributes



17. Statement of how the programme has been informed by the relevant subject benchmark statement(s)/professional, statutory and regulatory body guidelines

This post-graduate MSc programme has incorporated the requirements of the Modernising Scientific Careers of the UK National Health Service for providing the academic component – MSc Clinical Science (Medical Physics) for trainees healthcare scientists – speciality: Medical Physics. The programme is delivered only to part-time students.

The programme is derivative from MSc Medical Engineering and Physics (MEP), which has been built in accord with the guidelines of the UK professional body in the field – the Institute of Physics & Engineering in Medicine (IPEM) – and has been accredited by it as satisfying the Institute’s educational requirements for admission to Corporate Membership (a step leading to chartered professional status).

The programme MSc CS(MP) uses our original e-Learning materials Emerald and Emit, blended with classical learning. During December 2004 the original e-Learning materials on the medical physics, used in several of the modules of the Programme were awarded with the first ever international EU prize for education and training – the Leonardo da Vinci Award. These materials were produced by an international team led by Dept. Medical Engineering and Physics at KCL & KCH.

Apart from the everyday teaching and care the MSc CS (MP), part of the MSc MEP team, has made a number of educational and training developments including:

- Developing the first e-learning materials in medical physics (Emerald and Emit) – now used in some 70 countries (MSc MEP students were included in the evaluation of these materials).
- Developing the first e-Encyclopaedia of Medical Physics, where again we included some of our students. This large reference material is now used by all our students and internationally by some 7000 colleagues per month.

As a result the MSc MEP programme (part of which is MSc MP) and its students attracted a number of external awards during the past 10 years. Below is a list of those related to Medical Physics:

- 2004 – 1st prize for student/trainee presentation, IPEM Annual Conference (MSc MEP student/trainee)
- 2004 – The inaugural EU Leonardo da Vinci Award for vocational education for our Medical Physics e-Learning materials EMERALD & EMIT (Maastricht, Netherlands)
- 2006 – 1st prize for student/trainee presentation, IPEM Annual Conference (MSc MEP student/trainee)
- 2006 – The IOMP Harold Jones Medal for Excellence in Teaching and International Education Leadership (MSc MEP Director)
- 2007 – 1st prize for student/trainee presentation, IPEM Annual Conference (MSc MEP student/trainee)
- 2009 – Poster Award at SPIE Conference, USA (MSc MEP student)
- 2010 – Best IPEM Trainee of the Year (MSc MEP student/trainee)

18. In cases of joint honours programmes please provide a rationale for the particular subject combination, either educational or academic

N/A

Which is the lead department and/or School?

19. Programme structure

Please complete the following table and, if appropriate, to include joint, major/minor or other variations

Code = code of each module available for the programme

Title = title of each module available for the programme, plus its credit level and credit value

Status = please indicate whether the module is introductory (I), core (Cr), compulsory (Cp), one or more of however many modules must be passed to progress (CrCp), (P) professional (i.e. module testing skills/competency that has no credit level or value but is a professional body requirement) or optional (O) for each type of programme. For postgraduate programmes use the "single honours" column

Pre-requisite/Co-requisite = where appropriate please indicate whether the module is pre-requisite to another module or co-requisite by noting pre or co and the module code that it is pre/co-requisite to.

Assessment = please indicate in broad terms the assessment for the module eg written examinations, coursework

(Note: the availability of optional modules may vary slightly from year to year; the following are the modules available at the commencement of the programme)

Code	Title	Credit Level	Credit Value	Status (I, Cr, Cp, CrCp, P, O) for each type of module			Pre-requisite/ Co-requisite (Please note the module code)			Assessment
				Single	Joint	Major/Minor	Single	Joint	Major/Minor	
Part-time Study										
First Year										
	Healthcare Science and Research Methods	7	30	Cr						Coursework 100%
	Introduction to Medical Physics	7	30	Cr						Written Exam 70%, Coursework 30%
	Radiation Physics for Imaging and Radiotherapy	7	15	Cr						Written Exam 70%, Coursework 30%
Second Year										
<i>Students will normally take 15 credits from the following modules:</i>										
	Radiotherapy Physics	7	15	O						Written Exam 70%, Coursework 30%
	Radiation Safety	7	15	O						Written Exam 70%, Coursework 30%

	Medical Imaging with Non-ionising Radiation	7	15	O						Written Exam 70%, Coursework 30%
	Medical Imaging with Ionising Radiation	7	15	O						Written Exam 70%, Coursework 30%
Third Year										
	Research project	7	60	Cr						Project report 80% + oral (Int. rep + final oral exam) 20 %
<i>Students will also normally take 30 credits from the following modules:</i>										
	Further Radiation Physics	7	30	O			Co-requisite: Radiation Physics			Written Exam 70%, Coursework 30%
	Further Radiation Safety	7	30	O			Co-requisite: Radiation Safety			Written Exam 70%, Coursework 30%
	Further Medical Imaging with Non-ionising Radiation	7	30	O			Co-requisite: Medical Imaging with Non-ionising Radiation			Written Exam 70%, Coursework 30%
	Further Medical Imaging with Ionising Radiation	7	30	O			Co-requisite: Medical Imaging with Ionising Radiation			Written Exam 70%, Coursework 30%
If a Masters programme, are level 6 credit levels permitted within the programme? No										
Maximum number of credits permitted with a condoned fail (core modules excluded) None										
Are students permitted to take any additional credits, as per regulation A4; 5.8? No										

Are there any exceptions to the regulations regarding credits, progression or award requirements? (where relevant the information should also differentiate the particular requirements of pathways within a programme or nested/exit awards) No

Other relevant information to explain the programme structure

Please note that new students enrolling on the information provided on this section of the PAF will have these regulations stipulated throughout their programme of study. The only exception to this will be if there are changes made by Professional, Regulatory or Statutory Bodies that are noted to this programme.

The MSc Clinical Sciences (Medical Physics) is based on the well established award-winning programme MSc Medical Engineering and Physics (with a total of 195 credits). The programme provides students with the widest and most cohesive programme of learning relevant to the field of Medical Physics. The programme has been specially developed to follow the requirements of the UK Institute of Physics and Engineering in Medicine (IPEM). The programme MSc Clinical Sciences (Medical Physics) uses the re-organised modules of the MSc MEP and responds fully to the requirements of the UK DoH NHS Modernising Scientific Careers programme for delivery the academic component underpinning the training of Medical Physicists.

MSc Clinical Sciences (Medical Physics) will be delivered to UK based Part time students. Normally these students will also be NHS trainees in the speciality of Medical Physics.

Students have to complete their studies for 3 years – selecting 75 credits from core modules (to be taken during the 1st year), plus 1 optional modules (15 credits) = 30 credits plus one further optional module of 30 credits, plus MSc project 60 credits (during the 3rd year). The students have the flexibility to take some optional modules during the 1st or 2nd year and a further optional module during the 2nd or the 3rd year.

NB. To satisfy the requirements of the NHS Modernising Scientific Careers, Part Time students/trainees have to take the further optional module in the field of one of their selected optional module. Also the MSc Research project has to be in the field of the further optional module.

20. Marking criteria

All elements of assessment will be marked as per the College's generic marking criteria (in accordance with KCL criteria). The percentage weighting for the calculation of pass, merit and distinction will directly reflect the proportion of credits allocated to each module in relation to the overall credit taken within each programme/award, with classification thresholds set according to the core scheme as set out in the "credit framework regulations" of King's College London

21. Will this Programme report to an existing Board, and if so which one? If a new Programme Board of Examiners is to be set up please note name of Board here

The Exam Board of MSc Clinical Sciences (Medical Physics) coincides with the Exam Board of MSc Medical Engineering and Physics. Both are part of the Postgraduate Board of Examiners in the School of Medicine.

22. Please confirm that the process for nominating External Examiners has commenced, and if known, note whom the nominated External Examiner(s) may be

Two external examiners nominated – Dr Robert Shields, Dr Fernando Schindwein

23. Particular features of the programme which help to reduce the barriers experienced by disabled students and ensure that the programme is accessible to all students who meet the entry requirements

Admissions

All students in receipt of an offer receive information on the support services offered by the College

All students receiving offers who have indicated they have a disability in their application receive a letter from the School Disability Adviser with her contact details and offering the applicant the opportunity to discuss their requirements

Publicity and programme handbook

These clearly communicate the key skills that will be required during the programme, the content of each module, the intended teaching methods to be used and module's status i.e. core/ compulsory/ optional

Teaching methods

A wide range of teaching methods are utilised (as demonstrated in 16 above)

Assessment

Advice has been taken from the Equality & Diversity Department to ensure assessment methods do not unfairly discriminate against students with disabilities. The College's Special Examination Assessment Committee (SEAC) considers requests for adjustments to assessment to take account of learning and/or physical disabilities. Module outlines specify

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the assessment methods that will be used and explain that SEAC will need to be notified about requests for alternative assessment methods.

Feedback

Feedback on the programme is regularly collected from students about their learning experience. The information collected is used towards the on-going development and improvement of the programme. In particular, it has prompted closer working with ISS to ensure that subject resources are offered in a range of alternative formats wherever possible

PROGRAMME APPROVAL FORM
SECTION 3 – SUPPLEMENTARY INFORMATION

Not all of the information in this section will be relevant for all programmes and for some programmes this section will not be relevant at all

1. Programme name MSc Clinical Science (Medical Physics)

2. Is this programme involved in collaborative activity?

Yes

No

If yes what type of Collaborative Provision is it (*tick appropriate box*)?

Does the programme have an access/feeder Programme for entry into it?

Does the programme have an articulation/ progression agreement for entry into it?

Dual Award

Franchised Provision

Joint Award

Partnership Programme

Recognition of Study or Award of Credit through off-campus study or placement

Staff and student exchange

Validated provision

Have the relevant stages and appropriate paperwork been approved and the paperwork forwarded onto ASQ Office?

Yes

No

Not applicable

3. If the programme is a joint award with an institution outwith the University of London, validated provision or franchised provision, has the necessary approval been sought from College Education Committee?

Yes

No

Not applicable

Please attach a copy of Part 1 of the Partner Profile and checklist submitted to the College Education Committee

4. Partnership programme - in cases where parts or all of the programme are delivered away from one of the College campuses by a body or bodies external to the College please provide the following details

Name and address of the off-campus location and external body

Institute of Cancer Research (ICR)
Physics Department, Royal Marsden NHS Trust
Downs Road, Sutton, Surrey SM2 5PT

Percentage/amount of the programme delivered off-campus or by external body

The collaboration of the programme with ICR affects mainly the students-trainees who take Medical Physics further optional MSc taught subjects. For them it occupies part of 30 credits.

Nature of the involvement of external body

The programme MSc MEP (derivative of which is MSc CS MP) was initially developed to deliver the academic element of the hospital medical physics trainees and this way includes many contributors from the associated NHS trusts to the Guy's King's and St Thomas' School of Medicine of KCL (most being honorary lecturers to KCL). The programme was originally delivered under the University of London as an Inter-Collegiate MSc course (including KCL and ICR). Being managed and coordinated by Dept. Medical Engineering and Physics at KCL, the programme was transferred to KCL in 1999. Following this the link with the ICR continued (in the field of Physics optional subjects), this Institution being one of the world-leading in the field. However the subjects delivered at ICR include also lecturers from KCL. Additionally most tutorials are guided by KCL lecturers. The coursework and exam papers for these modules are assessed by KCL lecturers.

Description of the learning resources available at the off-campus location

The learning resources at ICR are very similar to those at KCL. The benefit of the MSc programme from this collaboration is mainly due to the fact that the students exposure some of the latest radiological medical equipment and methods available at the ICR.

What mechanisms will be put in place to ensure the ongoing monitoring of the delivery of the programme, to include monitoring of learning resources off-site or by the external body?

The programme director monitors all subjects regularly (including those delivered by ICR) by observing and commenting on lecture delivery, lecture notes, coursework and exams. Additionally, some KCL lecturers take part in the ICR teaching modules and the ICR lecturers take part in the Examinations Board of the MSc programme. As mentioned above all coursework and exam papers for these modules are assessed by KCL lecturers.

Please attach the report of the visit to the off-campus location

5. Recognition of study or award of credit through off-campus study or placement - please indicate how the time will be spent, the length of time out, the amount of credit and whether it is a compulsory or optional part of the programme

Year abroad	Year in employment	Placement	Other (please specify)
<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>

Time spentCredit amountCompulsory/optional.....

6. Please provide a rationale for any such time outside the College, other than that which is a requirement of a professional, statutory or regulatory body

5. Please give details if the programme requires validation or accreditation by a professional, statutory or regulatory body

The programme does not require validation or accreditation by a professional body. However the programme is derivative from MSc Medical Engineering and Physics, which is validated and accredited by the UK Institute of Physics and Engineering in Physics (IPEM). Graduates who will seek (further in their career) a chartered professional status will need this accreditation.

Name and address of PSB

Institute of Physics & Engineering in Medicine, 230 Tadcaster Road, York YO24 1ES

Frequency of validation/ accreditation
Every 5 years

Date of next validation/ accreditation
July 2013