Programme Specification – 2016/17

1. Awarding body
   University of Surrey

2. Teaching institution (if different)
   NA

3. Final award and programme/pathway title
   MSc Radiation and Environmental Protection

4. Subsidiary award(s) and title(s)
   Award          Title
   PG Dip         Radiation and Environmental Protection
   PG Cert        Radiation and Environmental Protection

5. FHEQ Level
   7

6. Credits and ECTS credits
   180 UK credits, 90 ECTS credits

7. Name of Professional, Statutory or Regulatory Body (PSRB)
   NA

8. Mode of study and route code
   Mode of study  Route code
   Full-time      Y
   Full-time with PTY  N
   Part-time      Y
   Distance learning  N
   Short course   N

9. JACs code
   NA

10. QAA Subject benchmark statement (if applicable)
   NA

11. Other internal and / or external reference points
   NA

12. Faculty and Department/School
    Faculty of Engineering and Physical Sciences; Department of Physics

13. Programme Leader
    Professor Zsolt Podolyak

14. Date of production/revision of the specification
    March 2016

15. Educational aims of the programme
   The programme integrates the acquisition of core scientific knowledge with the development of key practical skills with a focus on professional career development within medical physics and radiation detection, and related industries. The principle educational aims and outcomes of learning are to provide participants with advanced knowledge, practical skills and understanding applied to medical physics, radiation detection instrumentation, radiation and environmental practice in an industrial or medical context. This is achieved by the development of the participants' understanding of the underlying science and technology and by the participants gaining an understanding of the legal basis, practical implementation and organisational basis of medical physics and radiation measurement.

16. Programme learning outcomes – the programme provides opportunities for students to develop and demonstrate knowledge and understanding, skills, qualities and other attributes in the following areas:

   Knowledge and understanding
   - A systematic understanding of Radiation and Environmental Protection in an academic and professional context together with a critical awareness of current problems and / or new insights (MSc).
   - A comprehensive understanding of techniques applicable to their own research project in Radiation and / or Environmental Protection (MSc).
- Originality in the application of knowledge, together with a practical understanding of radiation-based, experimental research projects (MSc).
- An ability to evaluate and objectively interpret experimental data pertaining to radiation detection (MSc).
- Familiarity with generic issues in management and safety and their application to Radiation and Environmental Protection in a professional context (MSc).
- A systematic understanding of Radiation Science in an academic and professional context together with a critical awareness of current problems and/or new insights (PGDip).
- Originality in the application of knowledge, together with a practical understanding of radiation-based, experiments (PGDip).
- An ability to evaluate and objectively interpret experimental data pertaining to radiation detection (PGDip).
- Familiarity with generic issues in management and safety and their application to Radiation and Environmental Protection in a professional context (PGDip).
- A systematic understanding of Radiation Physics in an academic and professional context together with a critical awareness of current problems and/or new insights (PGCert).
- A practical understanding of radiation-based experiment (PGCert).
- An ability to evaluate and objectively interpret experimental data pertaining to radiation detection (PGCert).
- Familiarity with generic issues in management and safety and their application to Radiation Protection (PGCert).

### Intellectual / cognitive skills

- The ability to plan and execute under supervision, an experiment or investigation and to analyse critically the results and draw valid conclusions from them. Students should be able to evaluate the level of uncertainty in their results, understand the significance of uncertainty analysis and be able to compare these results with expected outcomes, theoretical predictions and/or with published data. Graduates should be able to evaluate the significance of their results in this context (MSc).
- The ability to evaluate critically current research and advanced scholarship in the discipline of radiation protection (MSc).
- The ability to deal with complex issues both systematically and creatively, make sound judgements in the absence of complete data, and communicate their conclusions clearly to specialist and non-specialist audiences (MSc).
- The ability to plan and execute under supervision, an experiment and to analyse critically the results and draw valid conclusions from them. Students should be able to evaluate the level of uncertainty in their results, understand the significance of uncertainty analysis and be able to compare these results with expected outcomes, theoretical predictions and/or with published data. Graduates should be able to evaluate the significance of their results in this context (PGDip).
- The ability to deal with complex issues both systematically and creatively, make sound judgements in the absence of complete data and communicate their conclusions clearly to specialist and non-specialist audiences (PGDip).
- The ability to plan and execute under supervision, an experiment and to analyse critically the results and draw valid conclusions from them. Students should be able to evaluate the level of uncertainty in their results, understand the significance of uncertainty analysis and be able to compare these results with expected outcomes, theoretical predictions and/or with published data. Graduates should be able to evaluate the significance of their results in this context (PGCert).

### Professional practical skills

- The ability to communicate complex scientific ideas, the conclusions of an experiment, investigation or project concisely, accurately and informatively (MSc).
• The ability to manage their own learning and to make use of appropriate texts, research articles and
other primary sources (MSc).
• Responsibility for personal and professional development. Ability to use external mentors for
personal / professional purposes (MSc).
• The ability to communicate complex scientific ideas, the conclusions of an experiment, investigation
or project concisely, accurately and informatively (PGDip).
• The ability to manage their own learning and to make use of appropriate texts, research articles and
other primary sources (PGDip).
• Responsibility for personal and professional development. Ability to use external mentors for
personal / professional purposes (PGDip).
• The ability to communicate complex scientific ideas, the conclusions of an experiment, investigation
or project concisely, accurately and informatively (PGCert).

Key / transferable skills

• Identify and resolve problems arising from lectures and experimental work
• Make effective use of resources and interaction with others to enhance and motivate self-study
• Make use of sources of material for development of learning and research such as journals, books
and the internet
• Take responsibility for personal and professional development

17. Programme structure – including the route / pathway / field requirements, levels modules, credits,
awards and further information on the mode of study.

All programmes operate on a 15 credit modular structure over two semesters. All taught modules are
semester based and are worth 15 credits, which is indicative of 150 hours of learning, comprised of
student contact, private study and assessment. Project and dissertation modules can be either 15, 30,
45 or 60 credits and, additionally Master’s dissertations 90 credits.

Credits achieved from completing the dissertation / final project module cannot be attributed to a
subsidiary award. Students are unable to submit their dissertation until they have successfully
completed their taught modules.

This programme is studied full-time over one academic year and part-time over a maximum period of
five academic years with a minimum of two modules per academic year. In order to achieve the
principal award of an MSc a student must complete 180 credits, with a minimum of 150 credits at FHEQ
level 7 and the remainder at FHEQ level 6. Students are also eligible to exit the programme with the
following subsidiary awards:
• PG Dip – 120 credits with a minimum of 90 credits at FHEQ level 7 and the remainder at FHEQ
level 6
• PG Cert – 60 credits with a minimum of 45 credits at FHEQ level 7 and the remainder at FHEQ
level 6

In order for students to progress they must achieve a minimum average of 50%.

Programme adjustments (if applicable)

NA

FHEQ Level 7: Potential awards – MSc / PG Dip / PG Cert

<table>
<thead>
<tr>
<th>Module code</th>
<th>Module title</th>
<th>Core /compulsory /optional</th>
<th>Credit volume</th>
<th>Semester (1 / 2)</th>
</tr>
</thead>
<tbody>
<tr>
<td>PHYM032</td>
<td>Radiation Physics</td>
<td>Compulsory</td>
<td>15</td>
<td>1</td>
</tr>
<tr>
<td>Code</td>
<td>Module</td>
<td>Status</td>
<td>Credits</td>
<td>Year</td>
</tr>
<tr>
<td>--------</td>
<td>-----------------------------------------------------</td>
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<td>------</td>
</tr>
<tr>
<td>PHYM015</td>
<td>Radiation Measurement</td>
<td>Compulsory</td>
<td>15</td>
<td>1</td>
</tr>
<tr>
<td>PHYM058</td>
<td>Nuclear Metrology</td>
<td>Compulsory</td>
<td>15</td>
<td>2</td>
</tr>
<tr>
<td>PHYM048</td>
<td>Introduction to Biology and Radiation Biology</td>
<td>Compulsory</td>
<td>15</td>
<td>1</td>
</tr>
<tr>
<td>PHYM056</td>
<td>Radiation Protection and Nuclear Safety</td>
<td>Compulsory</td>
<td>15</td>
<td>2</td>
</tr>
<tr>
<td>PHYM057</td>
<td>Environment and Legislation</td>
<td>Compulsory</td>
<td>15</td>
<td>2</td>
</tr>
<tr>
<td>PHYM041</td>
<td>Extended Group Project</td>
<td>Compulsory</td>
<td>15</td>
<td>2</td>
</tr>
<tr>
<td>PHYM036</td>
<td>Radiation Laboratory Skills</td>
<td>Compulsory</td>
<td>15</td>
<td>1</td>
</tr>
<tr>
<td>PHYM021</td>
<td>Research Project and Dissertation</td>
<td>Compulsory</td>
<td>60</td>
<td>Summer semester</td>
</tr>
</tbody>
</table>

How many optional modules must a student choose in order to achieve the necessary amount of credits to achieve this level?

There are no optional modules.

18. Opportunities for placements / work-related learning / collaborative activity – please indicate if any of the following apply to your programme

<table>
<thead>
<tr>
<th>Description</th>
<th>Apply</th>
</tr>
</thead>
<tbody>
<tr>
<td>Associate Tutor(s)/ Guest Speakers/Visiting Academics</td>
<td>N</td>
</tr>
<tr>
<td>Professional Training Year (PTY)</td>
<td>N</td>
</tr>
<tr>
<td>Placement(s) (study or work that are not part of the PTY or Erasmus Scheme)</td>
<td>N</td>
</tr>
<tr>
<td>Clinical Placement(s) (that are not part of the PTY Scheme)</td>
<td>N</td>
</tr>
<tr>
<td>ERASMUS Study (that is not taken during Level P)</td>
<td>N</td>
</tr>
<tr>
<td>Study exchange(s) (that are not part of the ERASMUS Scheme)</td>
<td>N</td>
</tr>
<tr>
<td>Dual degree</td>
<td>N</td>
</tr>
</tbody>
</table>

19. Quality assurance

The Regulations and Codes of Practice for taught programmes can be found at: [http://www.surrey.ac.uk/quality_enhancement/index.htm](http://www.surrey.ac.uk/quality_enhancement/index.htm)