# Programme Specification
## Joint Integrated Masters

Applicable to all integrated master’s programmes

Please click [here](#) for guidance on completing this specification template.

## Part A: Programme Summary Information

<table>
<thead>
<tr>
<th>1. Title of programme:</th>
<th>MPhys Physics with Education (with recommendation for QTS)</th>
</tr>
</thead>
<tbody>
<tr>
<td>2. Programme Code:</td>
<td></td>
</tr>
<tr>
<td>3. Entry Award(s):</td>
<td>Credit: Level:</td>
</tr>
<tr>
<td>☐ BSc (Hons)</td>
<td></td>
</tr>
<tr>
<td>☐ BEng (Hons)</td>
<td></td>
</tr>
<tr>
<td>Integrated Master’s award, as indicated from the list below.</td>
<td>480 with QTS</td>
</tr>
<tr>
<td></td>
<td>Joint Integrated Masters with LJMU</td>
</tr>
<tr>
<td></td>
<td>MPhys Physics with Education (with recommendation for QTS) with at least 90 credits at level 7 including at least 60 credits at level 7 in Physics including pass in 7126SREF and placements</td>
</tr>
<tr>
<td>Please indicate the relevant Integrated Master’s qualification listed below:</td>
<td></td>
</tr>
<tr>
<td>☐ MBiol</td>
<td>☐ MChem</td>
</tr>
</tbody>
</table>

<p>| 4. Exit Awards: | Credit: Level: |
| ☒ BSc (Hons) | 480 without QTS |
| MPhys Physics with Education with at least 90 credits at level 7 including at least 60 credits at level 7 in Physics and at least 30 credits at level 7 in ITT but not including a pass in 7126SREF or placements. |</p>
<table>
<thead>
<tr>
<th></th>
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</thead>
<tbody>
<tr>
<td></td>
<td>360</td>
</tr>
<tr>
<td></td>
<td><strong>BSc Physics with Education</strong> with at 90 credits at level 6 including at least 60 credits at level 6 or above in ITT and at least 30 credits at level 6 or above in physics.</td>
</tr>
<tr>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>If it includes at least 60 credits at level 6 in Physics and at least 60 credits in ITT at level 6 or above in ITT and includes a pass in 7126SREF and placements then &quot;BSc Physics with Education (with recommendation for QTS)&quot; is awarded.</td>
</tr>
<tr>
<td></td>
<td></td>
</tr>
<tr>
<td>☐</td>
<td>BEng (Hons)</td>
</tr>
<tr>
<td>☒</td>
<td>UoL Single Diploma in Higher Education 240 with at least 90 at FHEQ level 5 or above.</td>
</tr>
<tr>
<td>☒</td>
<td>UoL Single Certificate in Higher Education 120 with at least 90 at FHEQ level 4 or above.</td>
</tr>
<tr>
<td>☐</td>
<td>Other (please specify below):</td>
</tr>
</tbody>
</table>

5. **Date of first intake:** Opt-in to year 3 September 2016

6. **Frequency of intake:** Annually in September

7. **Duration and mode of study:** 4 Year (MPhys)

8. **Applicable framework:** Model for Non-Clinical First Degree Programmes
   LJMU Academic Framework and Teachers’ Standards (2012)

**Framework exemption required:**

- No (please go to section 9)
- Yes (please provide a brief summary below)

Exemption to the capped resit rule: to permit students registered on this course who do not pass the ITT component (less than 50%) to have the option of taking the year 3 first semester physics modules uncapped.

- **Date exemption approved by AQSC:** Approved at AQSC 12/2/16

9. **Applicable Ordinance:** Ordinance 37. General Ordinance for Undergraduate Degrees
<table>
<thead>
<tr>
<th>New/revised Ordinance required:</th>
<th>☒ No (please go to section 10)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Please indicate the applicable boxes:</td>
<td>☐ Yes (please provide a brief summary below)</td>
</tr>
</tbody>
</table>

| Date new/revised Ordinance approved by Council: | |
|-----------------------------------------------| |

10. Faculty: Faculty of Science and Engineering

11. Level 2 School/Institute: School of Physical Sciences

12. Level 1 unit: Department of Physics

13. Campus: Main University of Liverpool Campus (ITT taught at I M Marsh Campus, LJMU)

14. Other contributors from UoL: |

15. Teaching other than at UoL: School of Education, Liverpool John Moores University (ITT modules) AND Astrophysics Research Institute, Liverpool John Moores University (PHYS105/165 only)

16. Director of Studies: Dr H L Vaughan (UoL) K Clays (LJMU)

17. Board of Studies: Board of Studies in Physics

18. Board of Examiners: Board of Examiners in Physics

19. External Examiner(s): Not determined yet

20. Professional, Statutory or Regulatory body: Physics Accreditation: Institute of Physics for Preliminary Approval (for validation purposes only) granted Jan 2015 (see supporting documentation IOP preliminary approval 18.2.15 .pdf) ITT provision: Department of Education (DfE) - LJMU hold accredited status for recommendation for QTS. The quality of provision is monitored through the Office for Standards in Education (OfSTED).

21. QAA Subject benchmark Statements(s): Physics, Astronomy and Astrophysics, 2008
22. Other reference points:

QAA UK Quality Code
Teachers’ Standards, 2012

23. Fees:

Standard UoL fees

24. Additional costs to the student:

Cost of photocopying and printing~£61 over 4 years.
Protective equipment for laboratory practicals will be provided.
Costs of travel to school placements. The bursary from NCTL is expected to cover this.

25. AQSC approval:


Part B: Programme Aims & Objectives

26. Aims Of The Programme

The aim of the programme is to produce graduates who will be eligible for careers as teachers of physics and science with Qualified Teacher status, professional physicists in fundamental research or industrial research and development, as well as Science Communication roles and careers open to general physics graduates.

No. Aim:

1. To provide an understanding of physics at a depth appropriate for those aiming for a professional career in the subject
2. To use the Department’s involvement in first-class international scientific research, both to enrich the teaching and to inform programme design
3. To encourage each student’s learning, understanding and application of the knowledge taught
4. To develop each student’s mathematical and analytical skills
5. To develop each student’s competence in Scientific communication, both in oral and written form
6. To provide opportunity for its students to achieve Qualified Teacher Status in the secondary school context.
7. To provide opportunity for students to achieve full academic potential, through study which encourages a high degree of initiative, independent judgement, self-motivation, critical self-awareness and self-education.
8. To develop students’ abilities in organisation, analysis and evaluation that can be fully utilised in application of their skills within the field of education.
9. To produce graduates with a wide knowledge base, competent in both theoretical and practical aspects of Secondary Physics education
10. To inculcate an appreciation of the broader social, political and commercial context in which schools operate.
11. To enable students to research, reflect, evaluate and analyse current issues in Secondary education
12. To produce graduates with a range of well-developed communication skills.

27. Learning Outcomes

No. Learning outcomes – Integrated Master’s degree

| QAA | Master’s degree (MPhys Physics with Education (with recommendation) |
A Master's degree with Honours (MPhys Physics with Education) may be awarded to a candidate who gains at least 450 credits of which at least 120 credits must be at a level equivalent to the first year of an honour’s degree (FHEQ level 4), at least 120 credits must be at a level equivalent to the second year of an honour’s degree (FHEQ level 5) and at least 120 credits must be at a level equivalent to the third year of an honour’s degree (FHEQ level 6) with at least 60 credits at FHEQ level 6 in Physics and 90 credits must be at a level equivalent to the fourth year of an integrated Master’s degree (FHEQ level 7) including at least 60 credits at FHEQ level 7 in Physics and passed 7126SREF and placements.

The subject-based aims above are addressed by a programme design that facilitates a wide-ranging set of learning outcomes embracing knowledge and understanding, intellectual skills and practical skills. The subject-based intended learning outcomes that should be attained by a successful student are:

| 6.6.1  | an understanding of most fundamental laws and principles of physics, along with their application to a variety of areas in physics, some of which are at (or are informed by) the forefront of the discipline |
| 6.6.2  | an ability to solve advanced problems in physics using appropriate mathematical tools. Students should be able to identify the relevant physical principles, to translate problems into mathematical statements and apply their knowledge to obtain order-of-magnitude or more precise solutions as appropriate |
| 6.6.3  | the ability to use mathematical techniques and analysis to model physical behaviour and interpret mathematical descriptions of physical phenomena |
| 6.6.4  | the ability to plan and execute under supervision an experiment or investigation, analyse critically the results and draw valid conclusions. Students should be able to evaluate the level of uncertainty in their results, understand the significance of error analysis and be able to compare these results with expected outcomes, theoretical predictions or with published data. They should be able to evaluate the significance of their results in this context. |
| 6.6.5  | experimental skills showing the competent use of specialised equipment, the ability to identify appropriate pieces of equipment and to master new techniques and equipment (applies to students on experimental programmes) |
| 6.6.6  | effective use of ICT skills at the level needed for project work; for example, a familiarity with a programming language, simulation software, or the use of mathematical packages for manipulation and numerical solution of equations |
| 6.6.7  | a working knowledge of a variety of experimental, mathematical and/or computational techniques applicable to current research within physics |
| 6.6.8  | the ability to communicate complex scientific ideas, the conclusions of an experiment, investigation or project concisely, accurately and informatively |
| 6.6.9  | the ability to manage their own learning and to make use of appropriate texts, research articles and other primary sources |

**ITT**

**ITT6.1** Critically analyse and synthesise scientific knowledge in relation to learning, teaching and assessment in physics and critically analyse, apply and evaluate key issues in relation to planning and delivering effective teaching

**ITT6.2** Critically reflect on the science curriculum and understand and critically evaluate the statutory and curricular frameworks and the Physics and Science frameworks within which teachers work

**ITT6.3** Critically review evidence to evaluate potential impact on learning and progress in physics and key issues impacting upon the organisation and management of learning in school
### ITT6.4
Evaluates the impact of education policy on learners and learning in the school context. Critically reflect on the implications of educational policy and practice for professional practice.

### ITT6.5
Critically analyse evidence and theory to inform classroom practice and evaluate inclusive learning, teaching and assessment methods and critically reflect on areas for professional development relating to inclusion.

### ITT7.1
Demonstrates a conceptual understanding of key issues impacting on learners within the 11-16 and 14/19 sectors in relation to their diverse needs and critically analyse, apply and evaluate key pedagogic principles in relation to planning for learning.

### ITT7.2
Demonstrates the ability to critically analyse and evaluate learning, teaching and assessment strategies and approaches within the secondary curriculum areas in relation to own practice, educational research and policy.

### ITT7.3
Engages in small-scale practitioner research focused on the critical evaluation of an aspect of learning, teaching and assessment within their subject and understand the relevance of practitioner and action research for teachers' professional development and improving educational experiences/outcomes for young people.

### ITT7.4
Demonstrates, within their subject/phase, independence and high levels of personal responsibility, applying a critical approach to planning and to the impact of teaching on pupil progress.

### ITT7.5
Critically analyse, reflect upon and evaluate their own practice in relation to national standards and selected aspects of recent research on learning, teaching and assessment and professional issues in 11-16 and/or 14-19 education.

### ITT7.6
Uses skills in reflection on practice developed during the module to consider target setting/action planning for the NQT year.

### ITT7.7
Successfully demonstrates achievement of all Teacher Standards (2012) required in module 7126SREF and pass teacher training placements.

## Learning Outcomes

<table>
<thead>
<tr>
<th>No.</th>
<th>Learning outcomes – Integrated Master’s degree</th>
</tr>
</thead>
<tbody>
<tr>
<td>QAA</td>
<td>Master’s degree (MPhys Physics with Education)</td>
</tr>
</tbody>
</table>

A Master’s degree with Honours (MPhys Physics with Education) may be awarded to a candidate who gains at least 450 credits of which at least 120 credits must be at a level equivalent to the first year of an honour’s degree (FHEQ level 4), at least 120 credits must be at a level equivalent to the second year of an honour’s degree (FHEQ level 5), at least 120 credits must be at a level equivalent to the third year of an honour’s degree (FHEQ level 6) with at least 60 credits at FHEQ level 6 in Physics and 90 credits must be at a level equivalent to the fourth year of an integrated Master’s degree (FHEQ level 7) including at least 60 credits at FHEQ level 7 in Physics but not passed 7126SREF or placements.

The subject-based aims above are addressed by a programme design that facilitates a wide-ranging set of learning outcomes embracing knowledge and understanding, intellectual skills and practical skills. The subject-based intended learning outcomes that should be attained by a successful student are:

- **6.6.1** an understanding of most fundamental laws and principles of physics, along with their application to a variety of areas in physics, some of which are at (or are informed by) the forefront of the discipline.
- **6.6.2** an ability to solve advanced problems in physics using appropriate mathematical...
tools. Students should be able to identify the relevant physical principles, to translate problems into mathematical statements and apply their knowledge to obtain order-of-magnitude or more precise solutions as appropriate.

6.6.3 the ability to use mathematical techniques and analysis to model physical behaviour and interpret mathematical descriptions of physical phenomena.

6.6.4 the ability to plan and execute under supervision an experiment or investigation, analyse critically the results and draw valid conclusions. Students should be able to evaluate the level of uncertainty in their results, understand the significance of error analysis and be able to compare these results with expected outcomes, theoretical predictions or with published data. They should be able to evaluate the significance of their results in this context.

6.6.5 experimental skills showing the competent use of specialised equipment, the ability to identify appropriate pieces of equipment and to master new techniques and equipment (applies to students on experimental programmes).

6.6.6 effective use of ICT skills at the level needed for project work; for example, a familiarity with a programming language, simulation software, or the use of mathematical packages for manipulation and numerical solution of equations.

6.6.7 a working knowledge of a variety of experimental, mathematical and/or computational techniques applicable to current research within physics.

6.6.8 the ability to communicate complex scientific ideas, the conclusions of an experiment, investigation or project concisely, accurately and informatively.

6.6.9 the ability to manage their own learning and to make use of appropriate texts, research articles and other primary sources.

**ITT**

ITT6.1 Critically analyse and synthesise scientific knowledge in relation to learning, teaching and assessment in physics and critically analyse, apply and evaluate key issues in relation to planning and delivering effective teaching.

ITT6.2 Critically reflect on the science curriculum and understand and critically evaluate the statutory and curricular frameworks and the Physics and Science frameworks within which teachers work.

ITT6.3 Critically review evidence to evaluate potential impact on learning and progress in physics and key issues impacting upon the organisation and management of learning in school.

ITT6.4 Evaluate the impact of education policy on learners and learning in the school context. Critically reflect on the implications of educational policy and practice for professional practice.

ITT6.5 Critically analyse evidence and theory to inform classroom practice and evaluate inclusive learning, teaching and assessment methods and critically reflect on areas for professional development relating to inclusion.

ITT7.2 Demonstrate the ability to critically analyse and evaluate learning, teaching and assessment strategies and approaches within the secondary curriculum areas in relation to own practice, educational research and policy.

ITT7.3 Engage in small-scale practitioner research focused on the critical evaluation of an aspect of learning, teaching and assessment within their subject and understand the relevance of practitioner and action research for teachers' professional development and improving educational experiences/outcomes for young people.

ITT7.4 Demonstrate, within their subject/phase, independence and high levels of personal responsibility, applying a critical approach to planning and to the impact of teaching on pupil progress.

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TQSD/15.16

2016-17 v.1

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### Learning Outcomes

<table>
<thead>
<tr>
<th>No.</th>
<th>Learning outcomes – Bachelor’s Honour’s degree</th>
</tr>
</thead>
<tbody>
<tr>
<td>QAA</td>
<td>Bachelor’s degree with Honours (BSc Physics with Education (with recommendation for QTS))</td>
</tr>
</tbody>
</table>

A Bachelor’s degree with Honours (BSc BSc Physics with Education (with recommendation for QTS)) may be awarded to a candidate who gains at least 360 credits of which at least 120 credits must be at a level equivalent to the first year of an honour’s degree (FHEQ level 4), at least 120 credits must be at a level equivalent to the second year of an honour’s degree (FHEQ level 5) and at least 90 credits must be at a level equivalent to the third year of an honour’s degree (FHEQ level 6) including at least 60 credits at level 6 or above in physics and at least 60 credits at level 6 or above in ITT including a pass in 7126SREF and placements.

6.5.1 a knowledge and understanding of most fundamental physical laws and principles, and competence in the application of these principles to diverse areas of physics

6.5.2 an ability to solve problems in physics using appropriate mathematical tools. Students should be able to identify the relevant physical principles and make approximations necessary to obtain solutions

6.5.3 the ability to execute and analyse critically the results of an experiment or investigation and draw valid conclusions. Students should be able to evaluate the level of uncertainty in their results and compare these results with expected outcomes, theoretical predictions or with published data. They should be able to evaluate the significance of their results in this context.

6.5.4 a sound familiarity with laboratory apparatus and techniques if on experimental programmes

6.5.5 effective use of appropriate ICT packages/systems for the analysis of data and the retrieval of appropriate information

6.5.6 an ability in numerical manipulation and the ability to present and interpret information graphically

6.5.7 an ability to use mathematical techniques and analysis to model physical behaviour

6.5.8 an ability to communicate scientific information. In particular, students should be able to produce clear and accurate scientific reports

6.5.9 an ability to manage their own learning and to make use of appropriate texts, research-based materials or other learning resources

### ITT

- ITT6.1 Critically analyse and synthesise scientific knowledge in relation to learning, teaching and assessment in physics and critically analyse, apply and evaluate key issues in relation to planning and delivering effective teaching
- ITT6.2 Critically reflect on the science curriculum and understand and critically evaluate the statutory and curricular frameworks and the Physics and Science frameworks within which teachers work
- ITT6.3 Critically review evidence to evaluate potential impact on learning and progress in physics and key issues impacting upon the organisation and management of learning in school
- ITT6.4 Evaluate the impact of education policy on learners and learning in the school context. Critically reflect on the implications of educational policy and practice for professional practice.
- ITT6.5 Critically analyse evidence and theory to inform classroom practice and evaluate inclusive learning, teaching and assessment methods and critically reflect on
## Learning Outcomes

**QAA Bachelor’s degree with Honours (BSc Physics with Education)**

A Bachelor’s degree with Honours (BSc Physics with Education) may be awarded to a candidate who gains at least 330 credits of which at least 120 credits must be at a level equivalent to the first year of an honour’s degree (FHEQ level 4), at least 120 credits must be at a level equivalent to the second year of an honour’s degree (FHEQ level 5) and at least 90 credits must be at a level equivalent to the third year of an honour’s degree (FHEQ level 6) with at least 60 credits at level 6 or above in ITT and at least 30 credits at level 6 or above in physics.

6.5.1 **a knowledge and understanding of most fundamental physical laws and principles, and competence in the application of these principles to diverse areas of physics**

6.5.2 **an ability to solve problems in physics using appropriate mathematical tools. Students should be able to identify the relevant physical principles and make approximations necessary to obtain solutions**

6.5.3 **the ability to execute and analyse critically the results of an experiment or investigation and draw valid conclusions. Students should be able to evaluate the level of uncertainty in their results and compare these results with expected outcomes, theoretical predictions or with published data. They should be able to evaluate the significance of their results in this context.**

6.5.4 **a sound familiarity with laboratory apparatus and techniques if on experimental programmes**

6.5.5 **effective use of appropriate ICT packages/systems for the analysis of data and the retrieval of appropriate information**

6.5.6 **an ability in numerical manipulation and the ability to present and interpret information graphically**

6.5.7 **an ability to use mathematical techniques and analysis to model physical behaviour**

6.5.8 **an ability to communicate scientific information. In particular, students should be able to produce clear and accurate scientific reports**

6.5.9 **an ability to manage their own learning and to make use of appropriate texts, research-based materials or other learning resources**

**ITT**

ITT6.1 **Critically analyse and synthesise scientific knowledge in relation to learning, teaching and assessment in physics and critically analyse, apply and evaluate key issues in relation to planning and delivering effective teaching**

ITT6.2 **Critically reflect on the science curriculum and understand and critically...**
evaluate the statutory and curricular frameworks and the Physics and Science frameworks within which teachers work

**ITT6.3**
Critically review evidence to evaluate potential impact on learning and progress in physics and key issues impacting upon the organisation and management of learning in school

**ITT6.4**
Evaluate the impact of education policy on learners and learning in the school context. Critically reflect on the implications of educational policy and practice for professional practice

**ITT6.5**
Critically analyse evidence and theory to inform classroom practice and evaluate inclusive learning, teaching and assessment methods and critically reflect on areas for professional development relating to inclusion

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## Learning Outcomes

**No.**  
**Learning outcomes – Bachelor’s Non-Honour’s degree**

<table>
<thead>
<tr>
<th>QAA</th>
<th>Bachelor’s Non-Honour’s degree (BSc Physics with Education)</th>
</tr>
</thead>
<tbody>
<tr>
<td>A degree without honours may be awarded to a candidate who gains at least 300 credits of which at least 120 credits must be at a level equivalent to the first year of an honour’s degree (FHEQ level 4), at least 120 credits must be at a level equivalent to the second year of an honour’s degree (FHEQ level 5) and at least 60 credits must be at a level equivalent to the third year of an honour’s degree (FHEQ level 6) with at least 60 credits at level 6 in ITT and with at least 15 credits at level 6 or above in physics.</td>
<td></td>
</tr>
</tbody>
</table>

6.5.1 a knowledge and understanding of most fundamental physical laws and principles, and competence in the application of these principles to a range of areas of physics

6.5.2 an ability to solve problems in physics using appropriate mathematical tools. Students should be able to identify the relevant physical principles and make approximations necessary to obtain solutions

6.5.3 the ability to execute and analyse critically the results of an experiment or investigation and draw valid conclusions. Students should be able to evaluate the level of uncertainty in their results and compare these results with expected outcomes, theoretical predictions or with published data. They should be able to evaluate the significance of their results in this context.

6.5.4 a familiarity with laboratory apparatus and techniques

6.5.5 use of appropriate ICT packages/systems for the analysis of data and the retrieval of appropriate information

6.5.6 an ability in numerical manipulation and the ability to present and interpret information graphically

6.5.7 an ability to use mathematical techniques and analysis to model physical behaviour

6.5.8 an ability to communicate scientific information.

6.5.9 an ability to manage their own learning and to make use of appropriate texts, research-based materials or other learning resources

**ITT**

**ITT6.1**
Critically analyse and synthesise scientific knowledge in relation to learning, teaching and assessment in physics and critically analyse, apply and evaluate key issues in relation to planning and delivering effective teaching

**ITT6.2**
Critically reflect on the science curriculum and understand and critically evaluate the statutory and curricular frameworks and the Physics and Science frameworks within which teachers work
<table>
<thead>
<tr>
<th>No.</th>
<th>Learning outcomes – Diploma in Higher Education award</th>
</tr>
</thead>
<tbody>
<tr>
<td>ITT6.3</td>
<td>Critically review evidence to evaluate potential impact on learning and progress in physics and key issues impacting upon the organisation and management of learning in school</td>
</tr>
<tr>
<td>ITT6.4</td>
<td>Critically analyse evidence and theory to inform classroom practice and evaluate inclusive learning, teaching and assessment methods and critically reflect on areas for professional development relating to inclusion</td>
</tr>
<tr>
<td>ITT6.5</td>
<td>Critically analyse evidence and theory to inform classroom practice and evaluate inclusive learning, teaching and assessment methods and critically reflect on areas for professional development relating to inclusion</td>
</tr>
</tbody>
</table>

### Learning Outcomes

<table>
<thead>
<tr>
<th>No.</th>
<th>Learning outcomes – Diploma in Higher Education award</th>
</tr>
</thead>
<tbody>
<tr>
<td>6.5.1</td>
<td>A Diploma in Higher Education may be awarded to a candidate who gains at least 240 credits of which at least 120 credits must be at a level equivalent to the second year of an honour’s degree (FHEQ level 5). Students completing Years 1 and 2 of the programme will have covered the core of physics specified by the Institute of Physics. This will provide them with basic knowledge, skills and understanding.</td>
</tr>
<tr>
<td>6.5.2</td>
<td>a knowledge and understanding of most fundamental physical laws and principles, and competence in the application of these principles to a range of areas of physics</td>
</tr>
<tr>
<td>6.5.3</td>
<td>an ability to solve problems in physics using appropriate mathematical tools. Students should be able to identify the relevant physical principles and make approximations necessary to obtain solutions</td>
</tr>
<tr>
<td>6.5.4</td>
<td>the ability to execute and analyse critically the results of an experiment or investigation and draw valid conclusions</td>
</tr>
<tr>
<td>6.5.5</td>
<td>a familiarity with some laboratory apparatus and techniques</td>
</tr>
<tr>
<td>6.5.6</td>
<td>use of appropriate ICT packages/systems for the analysis of data and the retrieval of appropriate information</td>
</tr>
<tr>
<td>6.5.7</td>
<td>an ability in numerical manipulation and the ability to present and interpret information graphically</td>
</tr>
<tr>
<td>6.5.8</td>
<td>an ability to use mathematical techniques and analysis to model physical behaviour</td>
</tr>
<tr>
<td>6.5.9</td>
<td>an ability to communicate scientific information</td>
</tr>
<tr>
<td>6.5.10</td>
<td>an ability to manage their own learning and to make use of appropriate texts or other learning resources</td>
</tr>
</tbody>
</table>

### Learning Outcomes

<table>
<thead>
<tr>
<th>No.</th>
<th>Learning outcomes – Certificate in Higher Education award</th>
</tr>
</thead>
<tbody>
<tr>
<td>6.5.1</td>
<td>A Certificate in Higher Education may be awarded to a candidate who gains at least 120 credits at a level equivalent to the first year of an honour’s degree (FHEQ level 4). Students completing Year 1 of the programme will have covered approximately half of the core of physics specified by the Institute of Physics. This will provide them with some basic knowledge, skills and understanding.</td>
</tr>
<tr>
<td>6.5.2</td>
<td>a knowledge and understanding of some fundamental physical laws and principles, and competence in the application of these principles to some areas of physics</td>
</tr>
<tr>
<td>6.5.3</td>
<td>an ability to solve problems in physics using appropriate mathematical tools</td>
</tr>
<tr>
<td>6.5.4</td>
<td>the ability to execute and analyse critically the results of an experiment or investigation and draw valid conclusions</td>
</tr>
</tbody>
</table>
### 6.5.4 a familiarity with some laboratory apparatus and techniques

### 6.5.5 use of appropriate ICT packages/systems for the analysis of data and the retrieval of appropriate information

### 6.5.6 an ability in numerical manipulation and the ability to present and interpret information graphically

### 6.5.7 an ability to use mathematical techniques and analysis to model physical behaviour

### 6.5.8 an ability to communicate scientific information

### 6.5.9 an ability to manage their own learning and to make use of appropriate texts or other learning resources

#### 27a. Mapping of learning outcomes:

<table>
<thead>
<tr>
<th>Learning outcome No.</th>
<th>Module(s) in which this will be delivered</th>
<th>Mode of assessing achievement of learning outcome</th>
<th>PSRB/Subject benchmark statement (if applicable)</th>
</tr>
</thead>
<tbody>
<tr>
<td>MPHYS Benchmark</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>6.6.1</td>
<td>101, 102, 103, 104, 201 202, 203, 204</td>
<td>Continuous assessment, written examination, problems set in workshops</td>
<td>Knowledge and understanding of most physical laws and principles</td>
</tr>
<tr>
<td>6.6.2</td>
<td>All FHEQ Level 6 &amp; 7 modules in physics</td>
<td>Continuous assessment, written examination, problems set in workshops, Oral Presentation</td>
<td>Ability to solve advanced problems in physics using appropriate mathematical tools</td>
</tr>
<tr>
<td>6.6.3</td>
<td>106, 107, 108, 206, 207, 208</td>
<td>Continuous assessment, written examination, problems set in workshops, oral presentation, poster presentation</td>
<td>Ability to use mathematical techniques and analysis to model physical behaviour and interpret mathematical descriptions of physical phenomena</td>
</tr>
<tr>
<td>6.6.4</td>
<td>106, 206, 468, 488</td>
<td>Continuous assessment, written examination, problems set in workshops, oral Presentation, poster presentation</td>
<td>Ability to execute and analyse critically results of experiment or investigation</td>
</tr>
<tr>
<td>6.6.5</td>
<td>106, 206</td>
<td>Continuous assessment, written examination, problems set in workshops, oral presentation, poster presentation</td>
<td>Experimental skills showing the competent use of specialised equipment, the ability to identify appropriate pieces of equipment and to master new techniques and equipment</td>
</tr>
<tr>
<td>6.6.6</td>
<td>205, 265, 488</td>
<td>Continuous assessment, written examination, problems set in workshops, oral presentation, poster presentation</td>
<td>Effective use of ICT skills for project work – programming language, simulation software, maths packages</td>
</tr>
<tr>
<td>6.6.7</td>
<td>206, 488</td>
<td>Continuous assessment, written examination, problems set in workshops, oral presentation, poster presentation</td>
<td>Knowledge of a variety of experimental, mathematical, computational techniques applicable to physics research</td>
</tr>
<tr>
<td>6.6.8</td>
<td>105,115,135, 145, 165, 205, 206, 265 , 468 ITT placement</td>
<td>Continuous assessment, written examination, problems set in workshops, oral presentation, poster presentation</td>
<td>Ability to communicate complex scientific ideas concisely, accurately and informatively</td>
</tr>
<tr>
<td>6.6.9</td>
<td>105,115, 135, 145, 165, 265, 468</td>
<td>Continuous assessment, written examination, problems set in workshops, oral presentation, poster presentation</td>
<td>Ability to manage own learning and make use of research articles and other primary sources</td>
</tr>
<tr>
<td><strong>ITT</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>ITT6.1</strong></td>
<td>6001ITTUG, 7226SPRAC</td>
<td>Written submission, peer presentation and Critique of work</td>
<td>Ability to communicate complex ideas verbally and in written form. Ability to self-reflect and evaluate own learning</td>
</tr>
<tr>
<td>Course Code</td>
<td>Course Name</td>
<td>Assessment Details</td>
<td>Learning Outcomes</td>
</tr>
<tr>
<td>-------------</td>
<td>-------------</td>
<td>---------------------</td>
<td>-------------------</td>
</tr>
<tr>
<td>ITT6.2</td>
<td>6001TTUG, 7226SPRAC</td>
<td>Written submission, peer presentation and Critique of work</td>
<td>Ability to communicate complex ideas verbally and in written form. Ability to communicate complex ideas drawing on theory and practice</td>
</tr>
<tr>
<td>ITT6.3</td>
<td>6001TTUG, 6002ITTUG</td>
<td>Written submission, peer presentation,</td>
<td>Ability to communicate complex ideas verbally and in written form. Ability to self-reflect and evaluate own learning and identify critical learning incidents</td>
</tr>
<tr>
<td>ITT6.4</td>
<td>6002ITTUG,</td>
<td>Written submission of reflective journal</td>
<td>Ability to self-reflect and evaluate own learning and identify critical learning incidents</td>
</tr>
<tr>
<td>ITT6.5</td>
<td>6003ITTUG</td>
<td>Written submission of a case study</td>
<td>Ability to make use of research articles and link theory with practice</td>
</tr>
<tr>
<td>ITT7.1</td>
<td>7136SLTA 7126SREF</td>
<td>Written submission of an action research report. Written submission of critical incidents and action plan</td>
<td>Ability to undertake small scale action research and link theory and practice. Ability to self-reflect and determine appropriate action plan for self-development</td>
</tr>
<tr>
<td>ITT7.2</td>
<td>7136SLTA</td>
<td>Written submission of an action research report.</td>
<td>Ability to undertake small scale action research and link theory and practice</td>
</tr>
<tr>
<td>ITT7.3</td>
<td>7136SLTA</td>
<td>Written submission of an action research report.</td>
<td>Ability to undertake small scale action research and link theory and practice</td>
</tr>
<tr>
<td>ITT7.4</td>
<td>7226SPRAC</td>
<td>Written submission of critique of work</td>
<td>Ability to communicate complex ideas drawing on theory and practice</td>
</tr>
<tr>
<td>ITT7.5</td>
<td>7126SREF</td>
<td>Written submission of critical incidents and action plan</td>
<td>Ability to self-reflect and determine appropriate action plan for self-development</td>
</tr>
<tr>
<td>ITT7.6</td>
<td>7126SREF</td>
<td>Written</td>
<td>Ability to self-reflect</td>
</tr>
</tbody>
</table>
### 27a. Mapping of learning outcomes:

<table>
<thead>
<tr>
<th>Learning outcome No.</th>
<th>Module(s) in which this will be delivered</th>
<th>Mode of assessing achievement of learning outcome</th>
<th>PSRB/Subject benchmark statement (if applicable)</th>
</tr>
</thead>
<tbody>
<tr>
<td>6.5.1</td>
<td>101,102,103,104 201,202,203,204</td>
<td>Continuous assessment, written examination, problems set in workshops</td>
<td>Knowledge and understanding of most physical laws and principles</td>
</tr>
<tr>
<td>6.5.2</td>
<td>All FHEQ Level 4 &amp; 5 modules</td>
<td>Continuous assessment, written examination, problems set in workshops</td>
<td>Ability to solve problems in physics using appropriate mathematical tools</td>
</tr>
<tr>
<td>6.5.3</td>
<td>106, 206</td>
<td>Continuous assessment, written examination, problems set in workshops, Projects and reports, Oral Presentation</td>
<td>Ability to execute and analyse critically results of experiment or investigation</td>
</tr>
<tr>
<td>6.5.4</td>
<td>106, 206</td>
<td>Continuous assessment, written examination, problems set in workshops</td>
<td>Sound familiarity with laboratory apparatus and techniques</td>
</tr>
<tr>
<td>6.5.5</td>
<td>105,115,135,145, 165, 106,205,265, 206</td>
<td>Continuous assessment, projects, field work</td>
<td>Effective use of appropriate ICT packages for analysis of data</td>
</tr>
<tr>
<td>6.5.6</td>
<td>All physics modules</td>
<td>Continuous assessment, written</td>
<td>Numerical manipulation and interpretation of</td>
</tr>
<tr>
<td>Table 28: Skills and Other Attributes</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

| ITT6.1 | 6001ITTUG, | Written submission, peer presentation | Ability to communicate complex ideas verbally and in written form. |
| ITT6.2 | 6001ITTUG, | Written submission, peer presentation | Ability to communicate complex ideas verbally and in written form. |
| ITT6.3 | 6001ITTUG, 6002ITTUG | Written submission, peer presentation, | Ability to communicate complex ideas verbally and in written form. Ability to self-reflect and evaluate own learning and identify critical learning incidents |
| ITT6.4 | 6002ITTUG, | Written submission of reflective journal | Ability to self-reflect and evaluate own learning and identify critical learning incidents |
| ITT6.5 | 6003ITTUG | Written submission of a case study | Ability to make use of research articles and link theory with practice |
### No. Skills and attributes:

<table>
<thead>
<tr>
<th>QAA</th>
<th>Physics Skills</th>
</tr>
</thead>
<tbody>
<tr>
<td>4.2.1</td>
<td>Ability to formulate and tackle problems in physics (i.e., identify the appropriate physical principles, use special and limiting cases and order-of-magnitude estimates, make assumptions and approximations explicit).</td>
</tr>
<tr>
<td>4.2.2</td>
<td>Ability to use mathematics to describe the physical world. They should have an understanding of mathematical modelling and of the role of approximation.</td>
</tr>
<tr>
<td>4.2.3</td>
<td>Ability to plan, execute and report the results of an experiment or investigation. They should be able to use appropriate methods to analyse their data and to evaluate the level of its uncertainty. They should also be able to relate any conclusions they make to current theories of the physics involved.</td>
</tr>
<tr>
<td>4.3</td>
<td>Students should be able to compare critically the results of model calculations with those from experiment and observation.</td>
</tr>
</tbody>
</table>

**Education Skills (from Education Studies benchmarks – where relevant)**

- Ability to critically analyse and discuss the research and recent initiatives appropriate to education issues and demonstrate understanding of their implications.
- Ability to demonstrate ability to analyse and deploy accurately techniques of analysis and enquiry.
- Ability to demonstrate understanding of key aspects of education by systematically acquiring coherent and detailed knowledge.
- Ability to critically evaluate National Statutory frameworks and recent initiatives impact on education in the relevant phase.
- Ability to utilize research methods in relation to areas of the relevant education sector.

**Generic Skills**

- **4.4.1 Problem-solving skills** – physics degree programmes involve students in solving problems with well-defined solutions. They will also gain experience in tackling open-ended problems. Students should develop their ability to formulate problems in precise terms and to identify key issues. They should develop the confidence to try different approaches in order to make progress on challenging problems.
- **4.4.2 Investigative skills** – students will have opportunities to develop their skills of Independent investigation. Students will generally have experience of using textbooks, and other available literature, of searching databases and the Internet, and of interacting with colleagues to derive important information.
- **4.4.3 Communication skills** – physics and the mathematics used in physics deal with surprising ideas and difficult concepts; good communication is essential. A physics degree should develop a student’s ability to listen carefully, to read demanding texts, and to present complex information in a clear and concise manner.
- **4.4.4 Analytical skills** – physics helps students learn the need to pay attention to detail and to develop their ability to manipulate precise and intricate ideas, to construct logical arguments and to use technical language correctly.
- **4.4.5 ICT skills** – during their studies, students will develop their computing and ICT skills in a variety of ways, including their ability to use appropriate software such as programming languages and packages.
- **4.4.6 Personal skills** – students should develop their ability to work independently, to use their initiative and to organise themselves to meet deadlines. They should gain experience of group work and be able to interact constructively.

**ITT Skills**
ITTS1 | Problem solving – students to develop strategies to solve problems individually and/or collaboratively

ITTS2 | Synthesis of information – Students should use a range of sources in order to gain a coherent understanding of issues in education in the sector. They will be able to devise and sustain arguments and to solve problems using current research ideas and techniques or through evaluating a range of information and evidence.

ITTS3 | Professional skills - Students will review, consolidate, extend and apply knowledge and understanding to develop effective teaching skills and reflect upon practice and its impact on other professionals in the sector. They will search for, select, analyse and interpret information from a variety of sources, including research, theory, inspection evidence and reports.

ITTS4 | Transferable/key skills – Teaching provides students with opportunities to communicate information, ideas, problems and solutions to specialist and non-specialist audiences and will develop the ability to make decisions in complex and unpredictable contexts. Students will become aware of different cultures and recognise ethical and socially responsible working practices.

28a. Mapping of skills and other attributes:

<table>
<thead>
<tr>
<th>Skills and other attributes No.</th>
<th>Module(s) in which this will be delivered and assessed</th>
<th>Learning skills, research skills, employability skills</th>
<th>Mode of assessing achievement of the skill or other attribute</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Physics Skill</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>4.2.1</td>
<td>105,115,135,145, 165, 106,107,108,205,206, 265</td>
<td>How to formulate and tackle problems in physics</td>
<td>Continuous Assessment, Written examination, problems set in workshops, Projects,</td>
</tr>
<tr>
<td>4.2.2</td>
<td>107,108,207,208</td>
<td>use of mathematics to describe the physical world.</td>
<td>Continuous Assessment, Written examination, problems set in workshops, Projects,</td>
</tr>
<tr>
<td>4.2.3</td>
<td>106,206</td>
<td>plan, execute and report the results of an experiment</td>
<td>Continuous Assessment, Projects,</td>
</tr>
<tr>
<td>4.3</td>
<td>106,206</td>
<td>Comparison of model calculations with experiment</td>
<td>Continuous Assessment, Projects,</td>
</tr>
<tr>
<td><strong>Generic Skill</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>4.4.1</td>
<td>101,102,103,104,</td>
<td>Problem-solving: Tackle open-ended problems</td>
<td>Continuous Assessment, Written examination, Class Tests, Oral Presentation, Poster Presentation,</td>
</tr>
<tr>
<td>4.4.2</td>
<td>105,115,135, 145, 165, 106, 206, 265</td>
<td>Investigation: Use of information</td>
<td>Continuous Assessment,</td>
</tr>
<tr>
<td>ITT SKILLS</td>
<td>ITTS1</td>
<td>6001ITTUG 6003ITTUG 7136SLTA 7126SREF 7226SPRAC</td>
<td>Problem Solving: Continuous Assessment (Observations: teaching Practice)</td>
</tr>
<tr>
<td>ITTS2</td>
<td>6001ITTUG 6002ITTUG 7136SLTA 7126SREF 7226SPRAC</td>
<td>Synthesis of information: Continuous Assessment (Critical evaluation reports)</td>
<td></td>
</tr>
<tr>
<td>ITTS3</td>
<td>6002ITTUG 6003ITTUG 7136SLTA 7126SREF 7226SPRAC</td>
<td>Professional Skills: Continuous Assessment (Reflective reports, Observations: Teaching Practice, )</td>
<td></td>
</tr>
<tr>
<td>ITTS4</td>
<td>PHYS165, PHYS265 6001ITTUG 6003ITTUG 7136SLTA</td>
<td>Transferable/key Skills Continuous Assessment: (Reflective Reports, Observations:</td>
<td></td>
</tr>
</tbody>
</table>
29 Career opportunities:

There is a shortage of qualified physics teachers in schools, which is not being met by the available graduates. This degree will provide the student with a recommendation for qualified teacher status - the professional requirement for teachers in England. It is hoped that all of our graduates will go into this profession.

Physics graduates are needed in industry where their training in the methodology of physics equips them for positions in engineering, management, marketing and administration in a wide variety of jobs with a strong technological bias. These graduates will also have extended practice in communicating to a non-specialist audience. This could lead to careers in science communication, media and technical sales.

30 Academic Requirements:

This is an opt-in programme. Candidates must be registered on another University of Liverpool physics programme and eligible for progression into the third year of MPhys programme F303 or F521 before transfer onto this programme. The transfer can happen at any point up to the end of year 2.

Entry requirements for Physics programmes
The entry requirements for other Physics programme, include A levels in both physics and mathematics. Applications are encouraged from students with other suitable qualifications, such as GNVQs, International Baccalaureate, Scottish Highers, Irish Leaving Certificate and kite-marked Access to Higher Education courses. For all students, evidence of a sufficiently strong background in science, equivalent to A level standard will be sought. Mature applicants are welcome and will normally be expected to show evidence of recent academic study, such as an appropriate Access course. All candidates receiving an offer for a Physics programme will be invited to visit the University of Liverpool to see the facilities and to find out more about the programme.

Additional entry requirements for Physics with Education (with recommendation for QTS).
Students will have to apply for the programme in writing and interview for a place on the degree in their second year. Interviews will be conducted by UoL and LJMU staff. The interviews for will take place at LJMU. Applicants will also meet the following criteria as a minimum:
- Have an average of 55% in the Level 5 physics modules
- Have at least a grade C or above in GCSE English and Maths or their equivalent
- Have passed the government literacy and numeracy tests
- Have a secure DBS clearance held by LJMU
- Pass the Occupational Health Check

31 Work experience:
None

32 Other requirements:

None

Part D: Programme Structure

33 Programme Structure:

Year 1 (Level 4) and Year 2 (Level 5) All 15 credit modules at University of Liverpool

In order to progress into Year 3, students must achieve an average of 55% in Year 2.
In order to progress to Year 4, students must achieve an average of 55% in Year 3 including at least 50% in all ITT modules and pass all Physics modules.

**Year 1 at UoL - standard Physics degree (All modules 15 credits at Level 4)**
- PHYS101 Newtonian Dynamics
- PHYS102 Thermal Physics
- PHYS106 Practical Physics I
- PHYS107 Maths For Physicists I
- PHYS103 Wave Phenomena
- PHYS108 Maths For Physicists II
- PHYS104 Modern Physics

And

**15 credits of existing Level 4 modules from**
- PHYS165 Working with Physics for Education I (preferred)
- OR
- PHYS105 Working with Physics I

**Progression:** 40% average in year 1

**EXIT:** Cert in Higher Education (with at least 90 credits at level 4 or above)

**Year 2 at UoL - standard Physics degree (All modules 15 credits at level 5)**
- PHYS201 Electromagnetism
- PHYS202 Condensed Matter
- PHYS206 Practical Physics II
- PHYS207 Maths For Physicists III
- PHYS203 Quantum and Atomic
- PHYS208 Maths For Physicists IV
- PHYS204 Nuclear and Particle

And

**15 credits of existing Level 5 modules from**
- PHYS265 Working with Physics for Education II (preferred)
- OR
- PHYS205 Working with Physics II
Progression to MPHYS Physics with Education (with recommendation for QTS): >55% in year 2, passed interviews, passed the government literacy and numeracy tests, have a secure DBS clearance and passed the Occupational Health Check

Progression to UoL single honors BSc Physics: <55% in year 2.

EXIT: Diploma in Higher Education (with at least 90 credits at level 5 or above)
Cert in Higher Education (with at least 90 credits at level 4 or above)

Year 3 Split between LJMU and UoL

Semester 1
Phase 1 and 2 of ITT school placements

6001ITTUG – Subject Pedagogy in Physics (20 credits at level 6: Required)
6002ITTUG – Professional Practice (20 credits at level 6: Required)
6003ITTUG – Inclusion (20 credits at level 6: Required)
LJMU is responsible for the delivery of the Initial Teacher Training (6XXXITTUG) Modules and school placements.

Semester 2
PHYS488 Modelling Physical Phenomena (15 credits at Level 7: Required)
PHYS370 Advanced Electromagnetism (15 credits at Level 6: Required)
AND
30 credits of existing Level 6 modules from
• PHYS388 Physics of Energy Sources (15 credits)
• PHYS384 Radiation Therapy Applications (15 Credits) PHYS361 Surface Physics (7.5 credits)
• PHYS382 Physics of Life (7.5 credits)
• PHYS377 Particle Physics(7.5 credits)

Note:
• that once the optional modules have been selected they become required for the programme.
• level 7 modules carry a pass mark of 50%

UoL is responsible for the delivery of the Physics (PHYSXXX) modules.

Progression to MPhys Physics with QTS: at least 55% in year 3 AND at least 50% in all ITT modules AND pass all physics modules. Pass needed in all ITT school placements.

Progression to BSc with opportunity to resit S1 of BSc Physics: (Not passed ITT components (modules and/or placements) and passed 60 credits at level 6 in physics only)

EXIT:
BSc (Hons) Physics with Education (with at least 90 credits at level 6 including at least 60 credits at level 6 in ITT and at least 30 credits at level 6 or above in physics)
BSc (Non-Honours) Physics with Education (with at least 60 credits at level 6 in ITT and with at least 15 credits at level 6 or above in physics)
Single award University of Liverpool Diploma in Higher Education (with at least 90 credits in Physics at level 5 or above)
Classification of BSc award has the following weightings: Year 1 0%, Year 2 30%, Year 3 70%.
Programme Specification Integrated Master's

Year 4 Split between LJMU and UoL

Semester 1
PHYS361 Quantum Mechanics and Atomic Physics (15 credits at Level 6: Mandatory)
AND
15 credits from existing level 7 modules from
- PHYS470 Classical Mechanics (15 credits at Level 7)
OR two from
- PHYS491 Research Skills (7.5 credits at Level 7)
- PHYS497 Magnetic Structure and Function (7.5 credits at Level 7)
- PHYS481 Accelerator Physics (7.5 credits at Level 7)

Both Semesters
PHYS468 Education Project (30 credits at Level 7: Mandatory)
Phase 3 of ITT - school placements
Initial Teacher Training Modules (all required)
7126SREF – Developing Professional Reflective Practice (20 credits at Level 7)
7136SLTA – Learning, Teaching and Assessment (20 credits at Level 7)
7226SPRAC7226SPRAC – Pedagogy in Practice (20 credits at Level 7)

LJMU is responsible for the delivery of the Initial Teacher Training (7XXXPG) Modules and school placements.
UoL is responsible for the delivery of the Physics (PHYSXXX) modules.

Note:
- that once the optional modules have been selected they become required for the programme.
- level 7 modules carry a pass mark of 50%

EXIT:
MPhys Physics with Education (with recommendation for QTS)
(with at least 90 credits at level 7 including at least 60 credits at level 7 in Physics including pass in 7126SREF and placements)
MPhys Physics with Education
(with at least 90 credits at level 7 including at least 60 credits at level 7 in Physics but not passed 7126SREF and placements)
Classification of MPhys award has the following weightings: Year 1 0%, Year 2 20%, Year 3 40%, Year 4 40%.

BSc (Hons) Physics with Education (with recommendation for QTS)
(with at least 90 credits at level 6 including at least 60 credits at level 6 or above in physics and at least 20 credits at level 7 in ITT including pass in 7126SREF and placements)
BSc (Hons) Physics with Education
(with at least 60 credits at level 6 or above in ITT and at least 30 credits at level 6 or above in physics)
Classification of BSc award has the following weightings: Year 1 0%, Year 2 30%, Year 3 70%.

Industrial placement/work placement/year abroad:
120 days of work related learning will be provided in secondary schools
School based training will be coordinated via partnership arrangements with LJMU
and will be tailored to the requirements of the Standards required to achieve Qualified Teacher Status

35. **Liaison between the Level 2 Schools/Institutes involved:**

**Marketing for the programme**
Both UoL and LJMU staff will be involved in preparing material for advertising the programme to current UoL students. LJMU tutors will participate in marketing events held at UoL.

**Consideration of applicants to opt-in degree**
LJMU will be responsible for the application forms but both LJMU and UoL tutors will be involved in the decisions to accept applicants on to the programme, including part of the interview panel. Interviews will take place at LJMU.

**Communication throughout the programme**
There will be a programme director at each institution and they will be part of a Joint Operational Board. The programme directors will correspond regularly during the programme to keep both institutes apprised of student progress or factors affecting student experience. More informally there may be communication between UoL Academic Advisor and LJMU tutors. The Joint Liaison Group will be updated on the progress of the programme. Tutors at LJMU will be part of the UoL Board of Studies where reports of Student-Staff Liaison committees are received and planned changes are discussed. This will ensure that both programme directors are aware of changes to Physics programmes that may affect the degree.

The UoL Programme Director will be a member of the LJMU Partnership Strategic Development Board – a steering group that meets 3 times a year.

Tutors at LJMU will be invited to monitor lectures and sessions at UoL (e.g. PHYS165/265) and similarly tutors at UoL will be invited to monitor lectures and sessions at LJMU. This cross institutional monitoring will ensure development of complementary activities between the departments and share good practice in physics and skills training. The outcomes of monitored sessions will be reported at the Joint Operation Board.

The joint operational board will meet during the year to review student progress and evaluate the programme. It will receive reports of the two department’s staff student liaison committees (known as Board of Studies at LJMU). The outcomes of these meetings will be used to further develop the programme and enhance the student experience. This will report to the Joint Liaison Group.

**Co-Supervision of Students**
LJMU tutor will act as a second supervisor for the project in PHYS468. The tutor will be recognised as a university teacher at the University of Liverpool.

**Communication of intermediate assessment marks**
Both departments hold informal Board of Examiners (Assessment Boards – LJMU) meetings near the end of semester one to review student progress. A representative of the department will be invited to the other’s Board of Examiners. This will allow them to exchange progress reports. This will be especially important to determine progress on semester 2 of year 3 of the programme.

**Communication of Assessment Marks and Awards**
In this joint programme all education modules will be taught and assessed by LJMU tutors under the LJMU Academic regulations. Assessment marks for these modules will be awarded at their Board of Examiners (Assessment Boards – LJMU). All physics modules will be taught and assessed by UoL tutors under the UoL regulations. Assessment marks for these modules will be awarded at the
Physics Board of Examiners.
A representative of the partner department will be invited to the other department’s Board of Examiners (Assessment Boards – LJMU)
Marks will be discussed at the Joint Board of Examiners. Exit awards and classifications will be awarded at the Joint Board of Examiners/Assessment Board.

The external examiner will be present at both departmental Board of Examiners/ (Assessment Boards – LJMU) and the Joint Board of Examiners.

Part E: Learning, Teaching and Assessment Strategies

36. Learning, Teaching and Assessment Strategies:

Physics
The Learning, Teaching and Assessment strategies are the same as those for other Physics undergraduate degree provision in Liverpool. The teaching and assessment are designed to facilitate the development of understanding and utilisation of the practical, mathematical and problem-solving skills widely expected of Physics graduates. The teaching combines classroom methods such is lectures, workshops, problems classes and tutorials, together with a strong emphasis on practical laboratory training and project work. It also makes use of subject-specific e-learning resources, as well as digital technologies provided as standard by the university of Liverpool, such as VITAL, to support students’ private study. Teaching includes both formative and summative instruction to ensure that students are provided with opportunities to assess their own learning. Assessment is through combinations of examinations and/or continuous assessment appropriate for each module to assess the progress of students.

ITT
Lectures develop the students' skills in listening and processing technical information. The students are encouraged to interact during the lectures; to question, to express opinions and to influence the content. Thus the distinction between lecture/seminar and workshop is not rigid. Students are strongly encouraged to discover information for themselves and take responsibility for their own learning, making full use of the LRC and interactive online learning opportunities. An element of school-based learning is compulsory and this will involve structured lesson observations, collaborative teaching, and sustained experience of independent planning, teaching, assessment and evaluation, structured school-based tasks. All modules in the programme emphasise student-centred learning, involving students in practical teaching and school-based activities followed by discussion, reflection, feedback and a wider application of the concepts. Seminars, workshops and practicals encourage students to reflect, express thoughts and opinions and ask questions. Some group work is undertaken through task-based discussions and group presentations. ICT and study skills are taught and developed. Email, WWW & Blackboard (VLE) are increasingly being used to impart information

36a. Learning, Teaching and Assessment methods:

Physics
• The Programme material is delivered in modules, which are defined in the Department’s Undergraduate Student Handbook in terms of aims, learning objectives and assessment.

• In the majority of modules the primary mode of delivery are the lectures, which introduce the student to the subject, map out the module content and give structure to the module.

• Lecture-based modules in Years 1 and 2 are augmented by integrated sets of workshops or problems classes which provide the students with the opportunity to practise the application of the lecture material in a structured environment.

• In Years 3 and 4 small-group tutorials, led by lecturers who are specialists in a relevant research field, allow a deeper exploration of the module material. The tutor can use his/her research experience to steer the tutorial and can adapt in a flexible way to the learning needs of the small number of students.

• Emphasis is also placed on the importance of students’ private study, with recommended private study times listed in the Student Handbook. The private study will be typically a combination of revising the lecture notes, reading recommended texts and using e-learning resources (such as Mastering Physics).

• Practical work is varied and progressive in modules PHYS106 and PHYS206. It includes a 30 credit project in Year 4.

• Experience in computing and IT skills is based around an introductory module PHYS105/115/135/145/165 in Year 1 and a programming module PHYS205/265 in Year 2. These skills are applied in all of the practical work. There is also a specific programming module (PHYS488 Modelling Physical Phenomena) in which students undertake a high level computing project.

• Subject-specific and generic skills are taught and developed progressively throughout the Programmes. Written and oral communication skills, problem-solving skills, analysis skills and general study skills are embedded in the curriculum of Years 1 and 2 and practiced throughout Years 3 and 4.

• Oral communication skills develop as the students gain experience. Year 1 – a short presentation of a scientific topic to a year sub-group; Year 2 – a short presentation to academic staff (or school audience in PHYS265); Year 3 – ITT modules in which students are involved in teaching secondary school pupils; Year 4 – ITT modules in which students are involved in teaching secondary school pupils, the Research Skills module has a group activity investigating and reporting on a Physics-based problem with an individual interview as part of the assessment process, and the 30 credit MPhys Project has a 3 hour poster presentation, including detailed questioning by academic staff.

• Assessment is by end-of-semester examinations or continuous assessment. The various assessment components are intended to guide the student towards a balanced study of the subject and to measure as fairly as possible their ability. Examinations consist of questions designed to test knowledge and understanding as well as problem solving, analytical skills and insight.

• Continuous assessment forms a significant component of the assessment of modules in Years 1 and 2, where weekly problems classes and e-learning assignments contribute. Some Level 7 modules have large elements of continuous assessment where this is appropriate to the research-led style of teaching.
ITT

- The Programme material is delivered in modules, which are defined in the module guide in terms of aims, learning objectives and assessment.
- The School-based training programme is laid out in the Partnership handbook and the Placement handbook.
- Distinct workshops and practical sessions are held to enable students to develop relevant practical skills and to work in small groups to suggest and try out solutions to problems set.
- Assignments are set regularly with fixed deadlines and ICT use is expected.
- Verbal and written feedback fosters reflective awareness and independent learning.
- Formal evaluation of knowledge and understanding is through written assignments, completion of tasks and reports on progress in practice of teaching, submitted in a portfolio of evidence at the end of the course.
- There is explicit assessment of written assignments, completion of tasks and reports on progress in practice of teaching, is demonstrated throughout school experience and is a key component of the portfolio of evidence at the end of the course.
- Group-work skills are assessed through presentations and micro-teaching.

37. Assessment information for students:

Code of Practice on Assessment

The University of Liverpool has a Code of Practice on Assessment which brings together the main institutional policies and rules on assessment. The Code is an authoritative statement of the philosophy and principles underlying all assessment activities and of the University's expectations in relation to how academic subjects design, implement and review assessment strategies for all taught programmes of study.

The University of Liverpool Code of Practice includes a number of Appendices which provide more detail on the regulations and rules that govern assessment activity; these include:

- The University marks scale, marking descriptors and qualification descriptors;
- The model for non-clinical first degree programmes;
- The system for classifying three-year, non-clinical, undergraduate degrees;
- The system for classifying four-year, non-clinical, undergraduate degrees that include a year in industry or a year abroad;
- Information about students' progress, including guidance for students;
- The procedure for assessment appeals;
- Regulations for the conduct of exams;
- The University's policy on making adjustments to exam arrangements for disabled students.
- The code of practice relating to external examining (see also below)
- The Academic Integrity Policy, which covers matters such as plagiarism and collusion and includes guidance for students;
- The policy relating to mitigating circumstances which explains what you should do if you have mitigating circumstances that have affected assessment; and
- The policy on providing students with feedback on assessment.

Please click here to access the Code of Practice on Assessment and its appendices; this link will also give you access to assessment information that is specific to your cohort.
A summary of key assessment information is also available in the University of Liverpool 'Your University' handbook.

A summary of key assessment information is available in the Liverpool John Moores Programme handbook.

**Marking Descriptors for Physics Modules (Other than practicals and projects)**

**Marks in the range 90 - 100**
Candidates will demonstrate a comprehensive understanding of *a wide range of physical laws* and the ability to apply them to develop mathematical models or, in the context of a project, in diverse areas of physics. Answers will be logically structured and directly relevant to the question or problem and demonstrate a *mature ability to communicate physical arguments and an understanding of relevant current issues where appropriate*. Solutions to numerical questions or measurements made will *clearly and concisely* identify the relevant physical principles and demonstrate a high level of *analytical ability* and numerical accuracy.

**Marks in the range 80 - 89**
Candidates will demonstrate a comprehensive understanding of *a range of physical laws* and the ability to apply them to develop mathematical models or, in the context of a project, in diverse areas of physics. Answers will be logically structured and directly relevant to the question or problem and demonstrate a *well-developed ability* to communicate physical arguments. Solutions to numerical questions or measurements made will *clearly identify* the relevant physical principles and demonstrate *analytical competence* and a high level of numerical accuracy.

**Marks in the range 70 - 79**
Candidates will demonstrate a comprehensive understanding of *fundamental physical laws* and the ability to apply them to develop mathematical models or, in the context of a project, in diverse areas of physics. Answers will be logically structured and directly relevant to the question or problem and demonstrate *an ability* to communicate physical arguments. Solutions to numerical questions or measurements made will *clearly identify* the relevant physical principles and demonstrate a *high level of numerical accuracy*.

**Marks in the range 60 - 69**
Candidates will demonstrate a *sound understanding* of fundamental physical laws and *their use in developing mathematical models* or their application in the context of a problem. Answers will be logically presented, but with some omissions and irrelevant material. Solutions to numerical questions or measurements made will *use* the relevant physical principles and achieve a *good level of accuracy*.

**Marks in the range 50 - 59**
Candidates will display an *understanding* of fundamental physical laws and *their application in developing mathematical models* or their application in the context of a problem. Answers will be based *mainly on teaching inputs*, with omissions and irrelevant material indicating a deficiency in overall understanding. Solutions to numerical questions will demonstrate *an ability in numerical manipulation* but may contain errors of argument and incomplete calculations. Measurements made in the context of a project will be *sufficient* but may contain some errors.

**Marks in the range 40 - 49**
Candidates will display an *adequate knowledge* of fundamental physical laws and *an appreciation* of their use in developing mathematical models or their application in the context...
of a problem. Answers will be based on teaching inputs, with significant omissions and irrelevant material, and will lack logical structure with little evidence of overview of the subject. Solutions to numerical questions will demonstrate a limited ability in numerical manipulation and will include errors of argument and incomplete and inaccurate calculations. Measurements made in the context of a project will be adequate but may contain some errors and deficiencies.

Marks in the range 35 to 39
Candidates will display a limited knowledge of fundamental physical laws and a limited appreciation of their use in developing physical models or their application in the context of a project. Answers will be based on teaching inputs, with significant omissions and irrelevant material, and will lack logical structure with little evidence of understanding or overview of the subject. Solutions to numerical questions will demonstrate a very limited ability in numerical manipulation and will include serious errors of argument and incomplete and inaccurate calculations. Measurements made in the context of a project will be adequate but may contain some errors and deficiencies.

Marks in the range 30 to 34
Candidates will display an inadequate knowledge of fundamental physical laws and little appreciation of their use in developing physical models or their application in the context of a project. Answers will be based on a confused presentation of teaching inputs, with serious omissions and irrelevant material, and will lack logical structure with little evidence of understanding or no overview of the subject. Solutions to numerical questions or measurements made in a project will be incomplete and may contain errors and deficiencies.

Marks in the range 20 to 29
Candidates will display an inadequate knowledge of fundamental physical laws and lack appreciation of their use in developing physical models or their application in the context of a project. Answers will be based on a confused presentation of teaching inputs, with serious omissions and irrelevant material, and will lack logical structure with no evidence of understanding or overview of the subject. Solutions to numerical questions or measurements made in a project will be incomplete and will contain significant errors and deficiencies.

Marks in the range 10 to 19
Candidates will display little knowledge of fundamental physical laws and no appreciation of their use in developing physical models or their application in the context of a project. Answers will be confused and fragmentary and will lack logical structure with no evidence of understanding or overview of the subject. Solutions to numerical questions or measurements made in a project will be incomplete and will contain significant errors and serious deficiencies.

Marks in the range 0 to 9
Candidates will display very little knowledge of fundamental physical laws and no appreciation of their use in developing physical models or their application in the context of a project. Answers will be confused and fragmentary with no logical structure or evidence of understanding. Solutions to numerical questions or measurements made in a project will be fragmentary and will contain serious errors and deficiencies.

Marking descriptors for laboratory-based modules

<table>
<thead>
<tr>
<th>Marks</th>
<th>FHEQ Level 4 and 5</th>
<th>FHEQ Level 6</th>
</tr>
</thead>
<tbody>
<tr>
<td>80-100</td>
<td>Practical work completed flawlessly. Very good understanding of topic; puts practical work well in context where appropriate;</td>
<td>Practical work completed flawlessly. Very good understanding of topic; excellent grasp of general physical concepts. Work very</td>
</tr>
<tr>
<td>Score</td>
<td>Description</td>
<td>Examples</td>
</tr>
<tr>
<td>-------</td>
<td>-------------</td>
<td>----------</td>
</tr>
<tr>
<td>70-79</td>
<td>Practical work completed flawlessly. Good understanding of topic; puts practical work in context where appropriate; very well laid out; drawings, diagrams, graphs, data analysis and error analysis of high quality, well written. Compounds prepared in very good yield/purity.</td>
<td>Well laid out; drawings, diagrams, graphs, data analysis and error analysis of high quality, extremely well written. Ability to apply knowledge to new problems; work shows evidence of supplementary reading.</td>
</tr>
<tr>
<td>60-69</td>
<td>Practical work completed. Good understanding of topic; well laid out; good drawings, diagrams, graphs / data analysis / error analysis; very few errors; well written.</td>
<td>Practical work completed to a good standard. Good understanding of topic; good grasp of general physical concepts. Work laid out very well; drawings, diagrams, graphs, data analysis and error analysis of high quality, well written. Some ability to apply knowledge to new problems; work shows evidence of supplementary reading.</td>
</tr>
<tr>
<td>50-59</td>
<td>Practical work completed. General understanding of topic, but some errors or key points not understood; layout and data analysis not always appropriate; drawings, diagrams / graphs / error analysis at least adequate; expression and style adequate; grammar and spelling generally precise.</td>
<td>Practical work completed. General understanding of topic, but some errors or key points not understood; good grasp of most physical concepts, but some omissions. Layout of work and data analysis not always appropriate; drawings, diagrams / graphs / error analysis at least adequate; expression and style adequate; grammar and spelling generally precise.</td>
</tr>
<tr>
<td>40-49</td>
<td>Practical work incomplete. Shows some understanding but report incomplete, with errors; coverage of topic poor; layout and data analysis poor; error analysis poor; some drawings / diagrams / graphs / adequate, expression and style only adequate, with spelling / grammatical errors fairly common.</td>
<td>Practical work incomplete. Shows some understanding but report incomplete, with errors; coverage of topic poor. Layout of work and data analysis and error analysis adequate; some drawings / diagrams / graphs adequate, expression and style only adequate, with spelling / grammatical errors fairly common.</td>
</tr>
<tr>
<td>35-39</td>
<td>Sufficient to allow progression to next year of study. Major deficiencies in practical work. At least some relevant information and general drift sensible, but report incomplete with poor understanding; many errors; layout poor; drawings / diagrams /</td>
<td></td>
</tr>
<tr>
<td>&lt; 35</td>
<td>Very deficient or inadequate. Insufficient to allow progression to next year of study. Major deficiencies in practical work. Poor to no understanding of topic; very many errors and omissions; little or no substance; layout very poor or totally inappropriate; drawings, diagrams, graphs barely adequate; error analysis inadequate or missing; expression and style mostly poor; spelling / grammar poor.</td>
<td></td>
</tr>
<tr>
<td>Major deficiencies in practical work. At least some relevant information and general drift sensible, but report incomplete with poor understanding; many errors; layout poor; drawings / diagrams / graphs barely adequate; error analysis inadequate or missing; expression and style mostly poor; spelling / grammar poor.</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**Marking descriptors for project-based modules**

| 90-100 | Worked autonomously with a minimum of verbal guidance, and needed only essential supervision (e.g. demonstration of new techniques). Perceptive judgements made on various sources with very little prompting. Showed outstanding initiative and introduced and implemented a number of original ideas which showed remarkable insight at this level. Showed outstanding commitment and dedication to all aspects of the work during the allotted time. The student overcame difficulties or independently sought help where needed, specifying the problem extremely succinctly and clearly. The student communicated with the supervisor regularly, presenting primary results in a very readily accessible way, and clearly justifying their conclusions. |
| 80-89 | Worked very effectively with only limited guidance, and needed only essential supervision (e.g. demonstration of new techniques). Perceptive judgements made on various sources of experimental data/theory with very little prompting. Showed great initiative and introduced and implemented a number of original ideas. Was fully committed, spending all recommended time working on the project, and working very diligently during this time. The student independently sought help when needed, specifying the problem succinctly and clearly. The student communicated with the supervisor regularly, presenting primary results clearly with only very minor room for improvement. Conclusions (even if these later turned out to be erroneous!) were clearly justified. |
| 70-79 | Worked effectively with some verbal guidance, and needed only modest supervision. Sound, independent interpretation of experimental/data theory from several sources. Clearly understood and took responsibility for the progress of the project and regularly made useful suggestions about further developments. Was fully committed, spending almost all recommended time working on the project, and working very diligently during this time. The student independently sought help when needed, specifying the problem succinctly and clearly. The student communicated with the supervisor regularly, presenting primary results clearly }
with only very minor room for improvement. Conclusions (even if these later turned out to be erroneous!) were justified, with only minor room for improvement.

| 60-69 | Worked effectively with verbal guidance, but needed some practical supervision. Independent attempts to assess experimental data/theory largely successful, but some help needed in more difficult or unusual cases. Occasional suggestions made about development of project. Was certainly committed, spending most of the recommended time working on the project and working hard most of the time. The student usually sought help when needed, but sometimes needed prompting to recognise a problem. Once recognised though he or she could express the problem clearly. The student communicated with the supervisor regularly, primary results and conclusions were clearly presented and justified, again with some room for improvement. |
| 50-59 | Worked effectively with verbal guidance, but needed significant practical supervision. Independent attempts to assess experimental data/theory, but help often needed. Occasional suggestions made about development of project. Worked reasonably hard and spent sufficient time and effort to ensure adequate results. |
| 40-49 | Did not work effectively given only verbal guidance and significant supervision needed even with common procedures. Some independent interpretation of data attempted, but needed help even with quite straightforward problems. Limited initiative shown and no attempt made to suggest original idea. Was rather laid-back and showed a certain lack of commitment, spending insufficient time on the project, and not working all that hard. The student did not recognise problems when they arose in the project, and, even after prompting did not seem to be able to specify the problem in a clear way. The student communicated with the supervisor only when pushed. Some attempt was made to present primary results and conclusions, though the manner in which this was done left considerable room for improvement. |
| 35-39 | Did not work effectively given only verbal guidance, and constant supervision needed. Independent interpretation of data, if attempted at all, was usually flawed in some important respect. No initiative shown and no attempt made to suggest original ideas. Did the very bare minimum of work, significantly less than would have been expected from an average student. The student did not recognise problems when they arose in the project, and, even after prompting did not seem to be able to specify the problem in a clear way. The student made no real attempt to communicate with the supervisor even when pushed. When results and conclusions were finally extracted they were unclear, ambiguous and unreliable. |
| 20-34 | Did not work effectively given only verbal guidance, and constant supervision needed even with trivial tasks. No attempt to interpret data independently. No initiative shown and no attempt made to suggest original ideas. Through infrequent attendance or poor commitment when present, failed to make any
significant progress. Few inarticulate attempts to communicate with the supervisor were made, poor communication generated problems with the project.

<table>
<thead>
<tr>
<th>Score</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>1-19</td>
<td>Woefully deficient effort in all respects.</td>
</tr>
<tr>
<td>0</td>
<td>No evidence of activity.</td>
</tr>
</tbody>
</table>

**ITT**
- The LJMU grading descriptors for 2015/16 are contained in Section 1
- The assessment descriptors for the Teacher Standards (2012) which are the professional body requirements for Qualified Teacher Status are described in the: North West Consortium Trainee Teachers' Standards: Assessment Descriptors and Tracking Document See Section 2 below and Appendix 2 for full document.

**Section 1**

**LJMU grade descriptors**

Grade descriptors are generic statements that describe students’ achievement in assessment. They are expressed in a broad and non-specific manner so that they are applicable to a wide range of disciplines and assessment strategies. They confirm the breadth and depth of learning expected and the standard achieved in each grading band.

Grade descriptors clarify to students, staff and external stakeholders about the expectations at specific levels of study. They should be used by academic staff to generate assignment specific marking schemes and criteria. Therefore descriptors should inform, but not replace individual schemes or undermine professional autonomy.

Descriptors have been developed for levels 4-7 and are directly aligned to the QAA Frameworks for Higher Education Qualifications (FHEQ).

The structure of the grade descriptors is based on around the notion of a threshold pass. This articulates the minimum expectation for successful student performance at each level of study. Performance that deviates from that (in either a positive or negative direction) is described using adjectives that have been chosen to represent varied degrees of attainment. These are informed by the language that is typically used to describe academic performance (see table 1).

Grade bands span the full mark range to encapsulate a wider performance range and encourage marking across the full scale of available marks.

Grade descriptors are presented in a bullet-pointed and consistent style to illustrate the developmental nature of performance. They include:
1. Level-specific statements that link directly to FHEQ
2. Standard descriptors relating to:
   - Attainment of learning outcomes
   - Use of evidence
   - Accuracy
• Argument

These are consistent across all levels, as performance against these will be dependent on the nature of the assessment task that is itself defined by level.

3. The development of academic skill relating to:
• Writing style
• Presentation
• Referencing

This takes into account that these skills are not necessarily level-specific, but expectations regarding a student’s skill base will increase for higher levels of study. The focus is on written work, but it is envisaged that the standards implied in these can be translated to non-written tasks. There is no assumption that descriptors are weighted in any way (e.g. awarding a proportion of marks for referencing).

<table>
<thead>
<tr>
<th>Grade Band</th>
<th>Indicative Language</th>
</tr>
</thead>
<tbody>
<tr>
<td>90%-100%</td>
<td>exceptional, extraordinary, distinctive, remarkable</td>
</tr>
<tr>
<td>80%-89</td>
<td>authoritative, creative, exciting, illuminating, insightful, inspiring, outstanding, stimulating.</td>
</tr>
<tr>
<td>70%-79%</td>
<td>ambitious, convincing, critical, excellent, meticulous, original, persuasive, sophisticated, unexpected.</td>
</tr>
<tr>
<td>60%-69%</td>
<td>analytical, credible, fluent, precise, rigorous thorough.</td>
</tr>
<tr>
<td>50%-59%</td>
<td>accurate, careful, clear, coherent, congruent, confident, consistent, effective, good, thoughtful.</td>
</tr>
<tr>
<td>40%-49%</td>
<td>adequate, descriptive, satisfactory, straightforward, sufficient, unsophisticated</td>
</tr>
<tr>
<td>30%-39%</td>
<td>contradictory, derivative, inadequate, incomplete, inconsistent, imprecise, inexplicit, limited, unconnected, tangential, superficial, vague.</td>
</tr>
<tr>
<td>20%-29%</td>
<td>ambiguous, erroneous, incoherent, inappropriate, insufficient, irrelevant, unstructured, misleading, wrong.</td>
</tr>
<tr>
<td>0%-19%</td>
<td>absent, below par, deficient, formless, lacking missing.</td>
</tr>
</tbody>
</table>

Table 1: Indicative language for describing academic performance (Adapted from ‘Policies and Procedures for the Management of Assessment: Assessment Grading, Criteria and Marking’. Manchester Metropolitan University)

<table>
<thead>
<tr>
<th>Grade descriptors for Level 6 written work</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mark range</td>
</tr>
<tr>
<td>------------</td>
</tr>
<tr>
<td>90-</td>
</tr>
<tr>
<td>Score</td>
</tr>
<tr>
<td>-------</td>
</tr>
<tr>
<td>100</td>
</tr>
<tr>
<td>80-89</td>
</tr>
<tr>
<td>70-79</td>
</tr>
<tr>
<td>60-69</td>
</tr>
<tr>
<td>50-59</td>
</tr>
</tbody>
</table>
### Grade descriptors for Level 7 written work – 2016-17

**Please** note that these level 7 descriptors apply to programmes validated for a 2016 – 17 start when level 7 modules will have a pass mark of 50% (including those that form part of UG Masters programmes).

<table>
<thead>
<tr>
<th>Mark range</th>
<th>Characteristic</th>
<th>Criteria</th>
</tr>
</thead>
</table>
| 40-49      | Threshold / satisfactory pass | Adequate attainment of all learning outcomes
Demonstrates a reasonable grasp of key concepts with limited application to a specific area of study
Basic consideration of the literature and evidence-base, but restricted to recommended readings
There are some inaccuracies or irrelevant materials, but there is sufficient accurate material to suggest a threshold level of understanding
The argument is relatively clear, although some elements are difficult to understand
The writing style is reasonable and there are very few areas of confusion and/or errors in spelling/grammar.
Some errors in the use of the specified referencing system, but meets key principles
Good presentation that may include some organisational errors and/or a tendency not to conform to conventions of academic presentation |
| 30-39      | Needs improvement | Meets most, but not all learning outcomes
Demonstrates a reasonable grasp of key concepts, but no application to a specific area of study
Minor consideration of the literature and evidence-base, but inadequate use of recommended reading and no exploration outside that.
Some materials is accurate, but the amount of inaccurate or irrelevant materials indicates insufficient understanding of key concepts
The argument is poorly defined and defended
Writing style is acceptable. The structure is reasonable, but there are some areas of confusion and/or some errors in spelling/grammar
Attempts to use of the specified referencing system. Meets key principles, but there are systematic errors
Acceptable presentation that may include some organisational errors and a tendency not to conform to conventions of academic presentation |
| 20-29      | Needs significant revision | Does not meet most learning outcomes
Demonstrates a poor grasp of key concepts with no application to a specific area of study
Superficial consideration of the literature and evidence-base
There are major inaccuracies or significant amounts of irrelevant material
The argument is very weak
Writing style tends to be weak. The structure is confused and/or there are numerous errors in spelling/grammar.
Attempts to use of the specified referencing system, but there are significant errors
Generally weak or untidy presentation that may include some organisation errors and does not to conform to conventions of academic presentation |
| 0-19       | Needs substantial work | Does not meet any learning outcomes
Demonstrates a fundamentally flawed understanding of key concepts
No engagement with the literature and evidence-base
The material covered is inaccurate or irrelevant
The argument is incoherent
Writing style is poor. The structure is disorganised and/or there are many errors in spelling/grammar.
Does not use specified referencing system
Weak or untidy presentation |
<table>
<thead>
<tr>
<th>Score Range</th>
<th>Grade</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>90-100</td>
<td>Exceptional Pass</td>
<td>Exemplary attainment of all learning outcomes. Demonstrates an outstanding synthesis of varied theoretical positions in the analysis of key issues in the subject area. Wide-ranging emphasis on knowledge and ideas that are at the forefront of the discipline. Offers an exhaustive exploration of the literature and evidence-base. The material covered is accurate and relevant. The argument is highly sophisticated. The standard of writing is refined. No errors in the use of the specified referencing system. Well-presented and organised in an appropriate academic style.</td>
</tr>
<tr>
<td>80-89</td>
<td>Outstanding Pass</td>
<td>Excellent attainment of all learning outcomes, with some met to an exemplary standard. Demonstrates a comprehensive synthesis of varied theoretical positions in the analysis of key issues in the subject area. Wide-ranging emphasis on knowledge and ideas that are at the forefront of the discipline. Extends far beyond expected levels of engagement with the literature and evidence-base. The material covered is accurate and relevant. The argument is generally very astute. The standard of writing is refined. No errors in the use of the specified referencing system. Well-presented and organised in an appropriate academic style.</td>
</tr>
<tr>
<td>70-79</td>
<td>Excellent Pass</td>
<td>Excellent attainment of all learning outcomes. Demonstrates a thorough synthesis of varied theoretical positions in the analysis of key issues in the subject area. Strong emphasis on knowledge and ideas that are at the forefront of the discipline. Thorough use the literature and evidence-base. The material covered is accurate and relevant. The argument is persuasive and there are very perceptive elements. The standard of writing is refined. No errors in the use of the specified referencing system. Well-presented and organised in an appropriate academic style.</td>
</tr>
<tr>
<td>60-69</td>
<td>Good Pass</td>
<td>Good attainment of all learning outcomes. Demonstrates detailed synthesis of varied theoretical positions in the analysis of key issues in the subject area. Good emphasis on knowledge and ideas that are at the forefront of the discipline. Good consideration of the literature and evidence-base that develops from recommended readings. The material covered is accurate and relevant. The argument is persuasive. The standard of writing is refined. No errors in the use of the specified referencing system. Well-presented and organised in an appropriate academic style.</td>
</tr>
<tr>
<td>50-59</td>
<td>Pass</td>
<td>Adequate attainment of all learning outcomes. Demonstrates a limited, but sufficient, synthesis of varied theoretical positions in the analysis of key issues in the subject area. Some emphasis on knowledge and ideas that are at the forefront of the discipline. Sufficient consideration of the literature and evidence-base, but little beyond recommended readings. The material covered is mostly accurate and relevant. The argument is straightforward and relatively clear. The standard of writing is well clear and readable, with some sophisticated phrasing. No errors in the use of the specified referencing system. Well-presented and organised in an appropriate academic style.</td>
</tr>
<tr>
<td>Score Range</td>
<td>Grade</td>
<td>Description</td>
</tr>
<tr>
<td>-------------</td>
<td>-------</td>
<td>-------------</td>
</tr>
<tr>
<td>40-49</td>
<td>Needs some improvement</td>
<td>Meets most, but not all learning outcomes</td>
</tr>
<tr>
<td>30-39</td>
<td>Needs major improvement</td>
<td>Approximately half the learning outcomes are met</td>
</tr>
<tr>
<td>20-29</td>
<td>Needs significant revision</td>
<td>Most learning outcomes are not met</td>
</tr>
<tr>
<td>0-19</td>
<td>Needs substantial work</td>
<td>Does not meet any learning outcomes</td>
</tr>
</tbody>
</table>
Section 2
North West Consortium Trainee Teachers’ Standards
## Programme Specification Integrated Master's

**TQSD/15.16**

2016-17 v.1

### Standard 5: Set high expectations, which inspire, motivate and challenge pupils

<table>
<thead>
<tr>
<th>Experience (a)</th>
<th>Indicate/Plot yet evident (4)</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Outstanding</strong> (1)</td>
<td></td>
</tr>
<tr>
<td><strong>Good</strong> (2)</td>
<td></td>
</tr>
<tr>
<td><strong>Requires Improvement/Further</strong> (4)</td>
<td></td>
</tr>
</tbody>
</table>

**Notes:**
- Expected CPs and evidence which are achievable in the positon.
- The programme explicit values are expected pupils' values and behaviour.
- Academic and behaviour expectations are to be demonstrated.
- This statement reflects that pupils:
  - Can set goals through self-evaluation and challenge all expectations.
  - Can show the potential for pupils and challenge all expectations.
- The programme fosters pupils'
  - Intellectual growth and development.
- The programme fosters pupils personal and social development.
  - By making pupils feel safe and included.
  - By learning the subject matter.
- The programme fosters pupils practical and hands-on learning.
  - By making pupils feel safe and included.
  - By learning the subject matter.
- The programme fosters pupils practical and hands-on learning.
  - By making pupils feel safe and included.
  - By learning the subject matter.
- The programme fosters pupils practical and hands-on learning.
  - By making pupils feel safe and included.
  - By learning the subject matter.
- The programme fosters pupils practical and hands-on learning.
  - By making pupils feel safe and included.
  - By learning the subject matter.
- The programme fosters pupils practical and hands-on learning.
  - By making pupils feel safe and included.
  - By learning the subject matter.
- The programme fosters pupils practical and hands-on learning.
  - By making pupils feel safe and included.
  - By learning the subject matter.
- The programme fosters pupils practical and hands-on learning.
  - By making pupils feel safe and included.
  - By learning the subject matter.
38. **Student representation and feedback:**

<table>
<thead>
<tr>
<th>Student representation at University of Liverpool</th>
</tr>
</thead>
<tbody>
<tr>
<td>The Student–Staff Liaison Committee of the Department of Physics, UoL operates in accordance with the University of Liverpool’s Code of Practice on Student Representation. The Student–Staff Liaison Committee normally meets twice per semester. The membership of the Student–Staff Committee, its terms of reference, and the manner in which it conducts its business conforms to the requirements of the Annex of the Code of Practice on Student Representation. Elections to the Student–Staff Liaison Committee are carried out within the structure determined by the University Student Representation Steering Group and Programme Representatives will be encouraged to attend the training provided for them through the Liverpool University Student Training Initiative.</td>
</tr>
</tbody>
</table>

The Students are represented by students from each year of study elected by students registered for Physics modules at elections organised by the Department. The Staff include the Programme Director for the programme, the Head of Department, the Chair of the Board of Studies in Physics, the Director of Teaching, the Coordinator of Astrophysics Teaching at Liverpool John Moores University, the Year Coordinators and the other Programme Directors. A member of staff acts as coordinator for the Committee, reports students’ views to the Board of Studies and feeds back the Board’s response to the Committee. Reports from the committee will also be received at the Joint Operational Board set up for the programme.

Students on this programme will be strongly encouraged to be part of the Student-Staff Liaison Committee. There are also electronic feedback routes for students to provide information that is used at these meetings.

In addition, questionnaires are used annually in all modules to determine student reaction to the syllabus, the level of treatment, the relevance, the delivery and other aspects of the module. The returns are analysed by the lecturer, examined by the Director of Teaching and a summary is fed back to the students.

**Representation at LJMU**

**Student Feedback and Evaluation**

- LJMU use the results of student feedback from internal and external student surveys (such as the National Student Survey), module evaluation questionnaires and meetings with student representatives to improve the quality of programmes.
- For ITT students there is an annual Newly Qualified Teacher survey that provides valuable feedback on the quality of their training with respect to professional aspects of the programme.
- Students elect student representatives that provide feedback a formal Board of Studies (equivalent to UoL Student-Staff Liaison committee) meetings. The feedback will be reported to the Joint Operation Board.

Student representatives will participate in both university student feedback mechanisms to contribute to the development of the programme. If the demands of too many meetings become apparent- alternative means of collecting feedback will be agreed.

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**Part F: Status of Professional, Statutory or Regulatory Body Accreditation**

39. **Status of Professional, Statutory or Regulatory Body Accreditation:**

| Institute of Physics – Preliminary Approval – awaiting accreditation. |
PART G: DIVERSITY & EQUALITY OF OPPORTUNITY AND WIDENING PARTICIPATION

40. Diversity & Equality of Opportunity and Widening Participation:

The programme’s design, structure and content are consistent and compliant with both the University of Liverpool’s and Liverpool John Moores Policies on Diversity and Equality of Opportunity.

ANNEX 1

ANNEX OF MODIFICATIONS MADE TO THE PROGRAMME

Please complete the table below to record modifications made to the programme.

<table>
<thead>
<tr>
<th>Description of modification (please include details of any student consultation undertaken or confirm that students’ consent was obtained where this was required)</th>
<th>Minor or major modifications</th>
<th>Date approved by FAQSC</th>
<th>Date approved by AQSC (if applicable)</th>
<th>Cohort affected</th>
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