

**DEPARTMENT OF PHYSICS AND ASTRONOMY**

<b>PHY113-114-118</b>	<b>Professional Skills in Physics</b>	<b>PHY118 Philosophy Students</b>
<b>Academic Yr</b>	<b>10 Credits</b>	
<b>Staff contact</b>	<b>Dr M N Quinn - <a href="mailto:m.quinn@sheffield.ac.uk">m.quinn@sheffield.ac.uk</a></b> <b>Dr Ashley Cadby -<a href="mailto:a.cadby@sheffield.ac.uk">a.cadby@sheffield.ac.uk</a></b> <b>Dr Paul Smith -<a href="mailto:p.j.smith@sheffield.ac.uk">p.j.smith@sheffield.ac.uk</a></b>	

<b>Outline Description</b>	Training in practical laboratory work, introduction to scientific computing, data and error analysis, techniques of problem solving, scientific writing
<b>Restrictions</b>	None
<b>Prerequisites</b>	A levels at grades AAB which must include Mathematics and Physics
<b>Co requisites</b>	None
<b>Approx Time allocation (hours)</b>	Approx 4 hours per week -Lectures 10, Labs 30, Problem Solving 10, Independent 50,
<b>Assessment (%)</b>	<p>PHY113-114  Laboratory work: 40%  Experimental Uncertainties &amp; Data Analysis Assignment: 10%  Problem Solving Assignment: 10%  Computing Assignment: 15%  Formal Report: 25%</p> <p>PHY114  Laboratory work: 30%  Computing Assignment: 15%  AC Circuits: 20%  Formal Report: 25%  Practical Problem Solving: 10%</p> <p>PHY118  Laboratory work: 35%  Computing: 20%  Experimental Uncertainties &amp; Data Analysis Assignment: 10%  Problem Solving Assignment: 10%  Formal Report: 25%</p>
<b>Aims</b>	<p>The ability to pursue a career as a professional physicist relies not only on a sound understanding of the subject itself, but also on a number of skills associated with the execution, understanding, presentation and communication of experimental work and its results. These essential skills include:</p> <ul style="list-style-type: none"> <li>· the ability to communicate the results of scientific investigations by means of written reports and oral presentations.</li> <li>· an understanding of the importance of thorough and effective record keeping;</li> <li>· an appreciation of the correct approaches to problem solving;</li> <li>· the ability to plan an investigation;</li> <li>· the ability to manage your time effectively;</li> <li>· an understanding of the techniques of data analysis and of the importance of experimental uncertainties;</li> <li>· the ability to work with computer software such as Excel, Python, Word and Latex;</li> <li>· the ability to work as a member of a team;</li> <li>· the ability to operate commonly-used test equipment;</li> </ul>

## DEPARTMENT OF PHYSICS AND ASTRONOMY

	<p>· an understanding of basic measurement techniques;</p> <p>The aim of the First Year Professional Skills modules is to provide a thorough grounding in all these aspects, in the context of a laboratory environment. It should be apparent that the vast majority of these skills are not only essential for those intending to become professional scientists: they are a key part of all graduate-level careers. We hope, therefore, that all students will appreciate the importance of this module, regardless of their future career aspirations.</p>
Outcomes	See Aims
Recommended Books	<p>‘EXPERIMENTAL METHODS; an introduction to the analysis and preparation of data’ by L Kirkup (Wiley).</p> <p>Handouts: The detailed laboratory folder provided for laboratory work in PHY101 also has a description of procedures, timetables etc. for this module. Further instruction sheets are supplied as required for the computing work and for specific experiments.</p>
Syllabus	<ol style="list-style-type: none"> <li>1. Training in practical laboratory work</li> <li>2. Introduction to scientific computing</li> <li>3. Errors, uncertainties and data analysis</li> <li>4. Techniques of problem solving</li> <li>5. Scientific Writing</li> </ol> <p><b>To be taught via the following sessions:</b></p> <p>Week 2 Lecture/Problem Solving (pre-lab) “Key Skills” Experiments/Computing</p> <p>Week 3 Lecture/Problem Solving (pre-lab) “Key Skills” Experiments/Computing</p> <p>Week 4 Lecture/Problem Solving (pre-lab) “Key Skills” Experiments/Computing</p> <p>Week 5 Lecture/Problem Solving (pre-lab) “Key Skills” Experiments/Computing</p> <p>Week 6 Lecture/Problem Solving (pre-lab) Scientific Writing Workshop</p> <p>Week 8 Pre-lab Session and Experiments/Computing</p> <p>Week 9 Pre-lab Session and Experiments/Computing</p> <p>Week 10 Pre-lab Session and Experiments/Computing</p> <p>Week 11 Pre-lab Session and Experiments/Computing</p> <p>Week 12 Report Writing Session</p>
Academic Notes	