Overview
This module, which is for students on the joint degree programme Chemistry and Physics, provides guidance on literature, research and communication skills. Students choose area(s) of interest relevant to the joint degree to explore and to write a review article and provide a short presentation. The module thus addresses important professional skills, develops subject knowledge, and explicitly brings together the two halves of the degree programme.

Aims & Objectives
This module allows students to practise and extend their knowledge and understanding of physics and chemistry at the same time as gaining important and useful experience in transferable skills. These skills, which are sometimes referred to as professional skills or key skills, are a vital part of the abilities of a graduate physical scientist. While many of these skills are developed in 'conventional' modules, concentrating on these skills in this module should ensure that all our students have all these important abilities to a high level. These skills are vital for academic study and research, and for careers in industry, business, and elsewhere. They will help with the final year project report and presentation. Guidance, practice and assessment will be provided in the preparation and delivery of talks, critical reading of the literature, and formal scientific writing.

Learning Outcomes
By the end of this module students should be able to

- determine what it is that they do not yet know, but need to know in order to carry out a scientific task - use bibliographic search engines to find relevant scientific papers
- use the literature and the web to find scientific information
- evaluate critically information from different sources, and use this to inform a scientific argument or overview
- present such an argument or overview on paper and orally
- use PowerPoint appropriately to support a scientific presentation
- work independently and as part of a collaborative team
- know why these outcomes are important, and be confident in their ability to perform these tasks

Synopsis
1. The literature. Use of bibliographic databases, and work on relevant research literature in the physical sciences. Assignment on comparing two research papers, and writing a 400-word piece suitable for first year students explaining the science involved.
2. Literature review and oral presentation. Tutor support to research a relevant topic (same as in (3)), and prepare a 15 or 20 minute talk.
3. Literature review and written communication. Tutor support to research a relevant topic (same as in (2)) and write a 2000 word review article on the area.

Pre-requisites
CH3441, PH3082, PH3061

Anti-requisites
PH3014

Assessment
Coursework (including presentation 20%) = 100%
The assessment breakdown is expected to be:

<table>
<thead>
<tr>
<th>Activity</th>
<th>Percentage</th>
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<tbody>
<tr>
<td>Compare two papers assignment</td>
<td>20%</td>
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<tr>
<td>Science talk</td>
<td>20%</td>
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<tr>
<td>Review Article</td>
<td>60%</td>
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**Accreditation Matters**
This module may not contain material that is part of the IOP “Core of Physics”, but does contribute to the wider and deeper learning expected in an accredited degree programme. The skills developed in this module, and others, contribute towards the requirements of the IOP “Graduate Skill Base”.

**Recommended Books**
Please view University online record: [http://resourcelists.st-andrews.ac.uk/modules/ph4043.html](http://resourcelists.st-andrews.ac.uk/modules/ph4043.html)

**General Information**
Please also read the general information in the School’s honours handbook.