Introduction
A paper was submitted to the November 2012 meeting of the Board of Studies to initiate discussion about changes to the relative weightings of years 3 and 4 of the BSc Honours degree programmes in the School of Chemistry. This paper is reproduced below. The proposal received general support from the Board, with an action to seek the views of external examiners and the undergraduate student body before making a decision at the Board of Studies in February 2013. This consultation has taken place, with positive endorsement from both the students and from the two new External Examiners. The Board of Studies on Wednesday 13th February supported the decision to seek permission from CL&TC for the change in weighting.

Background
Since 2004/2005, BSc Honours degrees in Chemistry have been classified on the basis of the combined course results from Junior Honours (3rd year) and Senior Honours (4th year) years, with an equal weighting. This was in line with the requirements imposed by the University-wide Curriculum Project. These restrictions have now been relaxed. Examples include: (i) Edinburgh College of Art, which classifies honours degrees only on the basis of final year marks, and (ii) the School of Biological Sciences, who have very recently adopted a 2:1 weighting for Senior:Junior Honours marks. Moreover, the College of Science and Engineering is content for Schools to propose changes to the relative weightings of Junior and Senior Honours years on the basis of educational reasons, but has stipulated that there should be consistency in the weighting across the College, i.e. a 2:1 weighting should be the norm.

The following paragraphs raise some of the issues for consideration:

- Recent comments from the External Examiners have encouraged the School of Chemistry to make adjustments to the relative weightings.

  Prof. Tom Simpson
  We were made aware of discussions on the present 50:50 weighting for years 3 and 4 of the BSc programmes, and there was general support among the Externals for moving to a 40:60 weighting to give more credit to good final year performance.

  Prof. Ivan Parkin
  I think the BSc degree probably needs to give more weighting to the final year- perhaps 40:60 split rather than the 50:50 split at present.

  Prof. Mark Brouard
  Some adjustment of the weight in favour of Year 4 results would seem more consistent with practice elsewhere, and with the desire to give more emphasis to strong performance in the later years of the course.

- Unlike degree programmes in the College of Humanities and Social Sciences, Junior Honours courses (3rd year) in the School of Chemistry BSc degree programmes are all delivered and assessed at SCQF level 9 whereas final year courses are assessed at level 10. This reflects a clear progression from third year to fourth year. Performance in final year is much more relevant to graduate employability and selection for higher level study and so there is a strong argument that this should be reflected in the degree classification. There is a difference in intellectual challenge between these years and many students continue to develop throughout their full period of study, only realising their potential within their final year.

- Undergraduate (integrated) Masters programmes in Chemistry are classified either on the basis of a 20:40:40 ratio for the in-house MChem degree programmes, or on the basis of a 20:20:60 ratio for the MChemX degree programmes. For both of these cases, the final year (the equivalent of the Senior Honours year) has a higher weight than the third year.
With the current weighting, a poor mark in year 3 can have a large, negative impact on the overall performance in the BSc degree. A 1:2 weighting would allow this mark to enhance their performance in final year.

Most comparator chemistry departments allocate a higher weighting for the final year, e.g. York 40:60; Bath (32:68); Durham (33:67); Bristol (1:2); Manchester (40:60); Glasgow (25:75);

The Royal Society of Chemistry stipulates that activities based on independent investigative methodology would typically account for 25% of student workload in the final year. Clearly this is fulfilled for our BSc degree programmes with a 33.3% workload for the 40 credit practical component. There is no statement about how great a contribution to the final overall mark this practical work must make. Since there are equal proportions of practical work in both Years 3 & 4, the proportion of practical in the final classification mark would not be altered by changing the Y3:Y4 weighting (assuming that the transferable skills part of C3P is counted as practical). The BSc Chemistry Research Project/Transferable Skills course which currently contributes 16.7% to the overall degree classification mark would contribute 22.2% under a 1:2 weighting scheme.

If a change to the weighting were to be adopted, it would not affect the current cohort of Chemistry 3 students on the BSc programme, but would be implemented for students entering Chemistry 3 in September 2013.

The impact on the BSc degree in Chemical Physics is minimal – very few Chemical Physics students opt for the BSc degree programme. There is one course in Yr3 that is nominally L10 (10 pts), which is "Research Methods in Physics".

If weightings are changed then future students may work harder to attain higher marks in Y4. Conversely they may work less hard for their Y3, if this year is perceived to be less important.

Quantitative analysis of the impact on the BSc degree classification mark of changing Y3 & Y4 weightings

The following data cover the four cohorts of students who completed Chemistry 3 in years 2007-10 and who subsequently opted to follow the BSc Senior Honours.

The impact on these students’ final BSc classification mark of changing the Y3:Y4 weighting from the current 50:50 to a 1:2 weighting is shown in the following graph. The dotted lines demarcate a change in degree classification mark of ±2%.
The trivial consequence, of course, is that increasing the weighting given to Y4 will have negligible effect on those students with similar Y4 and Y3 marks, but will simultaneously accentuate the positive benefit on final classification mark to those students on a rising trajectory (Y4 mark > Y3 mark) and accentuate the negative benefit to those students on a falling trajectory.

Across these 4 cohorts, no student would have failed to attain the BSc(Hons) because of a change in weighting. Four of the students did fail to attain BSc(Hons) (3 in 2009 and 1 in 2010) but in all cases this was due to failing more than 40 credits in the final year so classification weighting was irrelevant.

The following table illustrates the number of students each year whose final classification marks would have increased or decreased on increasing the Y4 weighting, and the average magnitudes of these final classification mark changes.

<table>
<thead>
<tr>
<th></th>
<th>BSc in 2008</th>
<th>BSc in 2009</th>
<th>BSc in 2010</th>
<th>BSc in 2011</th>
</tr>
</thead>
<tbody>
<tr>
<td>No. of students</td>
<td>21</td>
<td>39</td>
<td>21</td>
<td>20</td>
</tr>
<tr>
<td>No. with higher classification mark on increasing Y4 weighting</td>
<td>19</td>
<td>13</td>
<td>10</td>
<td>8</td>
</tr>
<tr>
<td>No. with lower classification mark on increasing Y4 weighting</td>
<td>2</td>
<td>26</td>
<td>11</td>
<td>12</td>
</tr>
<tr>
<td>Mean change in classification mark moving to 1:2 weighting</td>
<td>0.93</td>
<td>-0.21</td>
<td>0.14</td>
<td>-0.33</td>
</tr>
<tr>
<td>Median change in classification mark moving to 1:2 weighting</td>
<td>0.82</td>
<td>-0.28</td>
<td>-0.14</td>
<td>-0.17</td>
</tr>
</tbody>
</table>

Of the 101 students across the 4 cohorts, 50 would have had higher a classification mark on increasing the Y4 weighting, and 51 would have had lower classification mark – a completely even number of ‘gainers’ and ‘losers’ (but note comment above that student behaviour might change if weightings were changed).

The mean or median change in classification mark is very small; for years 2009-2011 it is no more than ~0.2% for a change to a 40:60 weighting and no more than ~0.3% for a change to a 1:2 weighting. For some reason, the majority of those graduating in 2008 had better Y4 marks than their Y3 marks so the impact of increasing Y4 weighting on this specific cohort would have been greater but the average increase in classification mark would still have been only ~0.9% even for the more influential change to a 1:2 weighting.

Obviously some individual students do have marks that increase or decrease by markedly more than these averages, e.g. by more than ±2%, as illustrated by the points outside the dotted lines in the graphs above, but there will always be the occasional students who perform much better or much worse in their Y4 compared with their Y3.

It is not practical to attempt a detailed analysis of numbers of students whose marks may have changed classification bands because what matters in practice is those whose marks change into and out of a borderline region and the decisions on classification bands for these students are made by external examiners who may make different judgements on borderline cases, compared to their current judgements, if we were to change our weightings.

In strict numerical terms, a change in weighting would have made very little difference. Across these 4 years, no additional student would have passed BSc(Hons). One or two students a year may have gone up a classification band, but, equally, a few students may have dropped out of consideration for promotion up a band.

**Recommendation:**

The School of Chemistry changes the relative contributions of year 3 and year 4 for all of its BSc degree programmes from the current 50:50 weighting to a 1:2 weighting, i.e. a higher weighting for year 4. This change will be implemented for students entering Chemistry 3 in September 2013.

**Actions required:**

1. If the recommendation is accepted, then approval must be sought at College Learning and Teaching Committee
2. Changes implemented in Degree Regulations and Programmes of Study (DRPS)
3. Changes implemented to Chemistry 3 course documentation