

A Paper to improve Accessibility of Exam Mark Schemes and other Materials

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Union Notes:

1. The College is committed to improving accessibility for all of its members as outlined here: <https://www.imperial.ac.uk/estates-facilities/buildings/accessibility/>
<https://www.imperial.ac.uk/staff/tools-and-reference/web-guide/policies-and-guidance/accessibility-standards/>
2. Most lecturers type their solutions up in a clearly legible format which is accessible to everyone.
3. However, a small minority of lecturers only handwrite their mark schemes for their respective modules (see attached examples under sources).
4. Sometimes the handwriting is not legible depending on the lecturer as handwriting can vary massively from person to person.
5. The College does not appear to have any specific guidelines outlining how mark schemes for exam papers should be written.

Union Believes:

1. Handwritten mark schemes can be difficult to read especially for those who are visually impaired.
2. This can put those same people at a disadvantage.
3. Even for those who are not visually impaired it can still be hard to read what a lecturer has written (see attached examples under sources).
4. The consequences of this are that many students spend more time trying to understand their lecturer's handwriting instead of understanding and synthesising the content that is being taught.
5. This is in conflict of the College's commitments to improve accessibility.

Union Resolves:

1. Set a common standard for all college exam mark scheme solutions while clearly indicating where marks are awarded.
2. This common standard must have typed up solutions for all exam papers and mark schemes. This includes re-writing past paper mark schemes.
3. If lecturers still want to create handwritten solutions or partially handwritten solutions (for example, handwritten diagrams with typed explanations) then they may do so however there must be a typed up and fully legible alternative which increases accessibility.

Sources:

Examples of illegible mark Schemes:

Chemical Engineering Thermodynamics 2 Exam 2017:

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→ In a single phase system $P=1$,
So that
 $F=2$, then on the axes
of the diagram, S_1, S_2, S_3, L & V .

→ In two phase border $P=2$,
So that $F=1$
Then on the melting lines,
vap. press & sublimation are.

→ In triple points $P=3$ & $F=0$,
then on the triple points
in the diagram.

The Gibbs phase rule does not
restrict the number of triple points.

The phase diagram is physical. ✓

Chemical Engineering 2nd Year Mathematics Exam 2019:

$$(b) \cos^3 x = \cos \left(1 + \frac{\cos 2x}{2}\right)$$

$$= \frac{3}{4} \cos x + \frac{1}{4} \cos 3x \quad (2)$$

As before, this is the Fourier series.

$$\cos^5 x = \left(\frac{1 + \cos 2x}{2}\right) \left[\frac{3}{4} \cos x + \frac{1}{4} \cos 3x\right]$$

$$= \frac{3}{8} \cos x + \frac{1}{8} \cos 3x + \frac{3}{16} [\cos x + \cos 3x]$$

$$+ \frac{1}{16} [\cos x + \cos 5x]$$

$$= \frac{5}{8} \cos x + \frac{5}{16} \cos 3x + \frac{1}{16} \cos 5x \quad (2)$$

Note this contains only odd cosine terms upto $\cos 5x$.

Again

$$\cos^7 x = \cos 5x \left(1 + \frac{\cos 2x}{2}\right)$$

This involves only odd cosine terms upto 7.
 since $\cos kx \cos 2x = \frac{1}{2} [\cos(k+2)x + \cos(k-2)x]$
 we see that the pattern holds good for $\cos^n x$, n is odd.

(2.25)