Moderation of Module Marks

Department of Electrical & Electronic Engineering

Imperial College London

Moderation of marks is applied in four circumstances. Moderation is used to ensure that assessments are consistent where different candidates were marked by different assessors (such as in project and laboratory work).

Moderation is also used to ensure that assessments that are somewhat more difficult than expected do not lead more candidates failing than expected. It is also used to ensure that assessments that are somewhat more easy than expected do not lead more candidates achieving first class honours overall than expected. We do this to ensure that the first class honours classification retains its prestige. These points are routinely checked for all modules including those assessed by exam and those assessed by coursework (and combinations of the two). It is expected that moderation will only be required for a small number of modules and that assessors will be asked to ensure that future assessments are set to avoid moderation being needed.

The final reason for applying moderation is to ensure that variation in assessment standard between optional modules does not disadvantage or over-reward candidates marking certain module choices. This is routinely checked for all 3rd and 4th year modules taken by a large enough number of candidates to allow meaningful statistical analysis. Again, the aim is to set assessments which do not call for moderation.

Moderation of Assessment Marks between Different Assessors

Final Year Individual Projects

First and foremost, the guidance and the marking forms used by markers define how features of a candidate's performance map to marks so that assessors concentrate on identifying performance against benchmarks before moving to awarding marks. This is designed to achieve consistency and equity in the marking process. Further, each project has a first marker and second marker who assign marks and then must reach an agreed mark by discussing any differences. Finally, projects in the same topic areas are arranged in rank order and then topic experts can moderate marks if an anomaly is identified.

Laboratory Reports, Logbooks and Group Projects

First and foremost, clear definitions of levels of performance for each grade are identified. Laboratory supervisors then perform statistical analysis on marks from each assessor and can make adjustments if in their judgment they are needed to correct differences in assessment standards. Group project organisers look at projects in rank order and use their judgement to adjust marks if the markers comments indicate a different ordering to the marks or if other anomalies are identified in the overall marks.

Moderation of Module Marks for Overall Assessment Standard

Moderation is applied to modules if that module produces either an abnormally large number of E and F-grade results (failures) or an abnormally large number of A-grade results.

It is a piece-wise linear scaling function that preserves the rank order of the candidates. Four parameters are defined:

N_A^{Max} is the expected maximum number of candidates obtaining grade A and is set at 30% of the candidates

$mark_{A/B}$ is the boundary between A and B grades and is set at 70.

$N_{E/F}^{Max}$ is the expected maximum number of candidates obtaining grade E or F and is set at 10% of the candidates

$mark_{D/E}$ is the boundary between D and E grades and is set at 40.

The rank order list of candidate's marks for each module is examined and two tests are applied.

If the number of candidates scoring above $mark_{A/B}$ is greater than N_A^{Max} then moderation of the marks at the top of the class is required. To do this we identify $mark_{30C}$, the mark of candidate at position N_A^{Max} which is boundary of top 30% of candidates (known as the 30th centile).

If the number of candidates scoring below $mark_{D/E}$ is greater than $N_{D/E}^{Max}$ then moderation of the marks at the bottom of the class is required. To do this we identify $mark_{90C}$, the mark of candidate at position $N_{E/F}^{Max}$ is the boundary of bottom 10% of candidates (known as the 90th centile).

If moderation at both ends of the class is required the algorithm applied is:

If $mark < mark_{90C}$

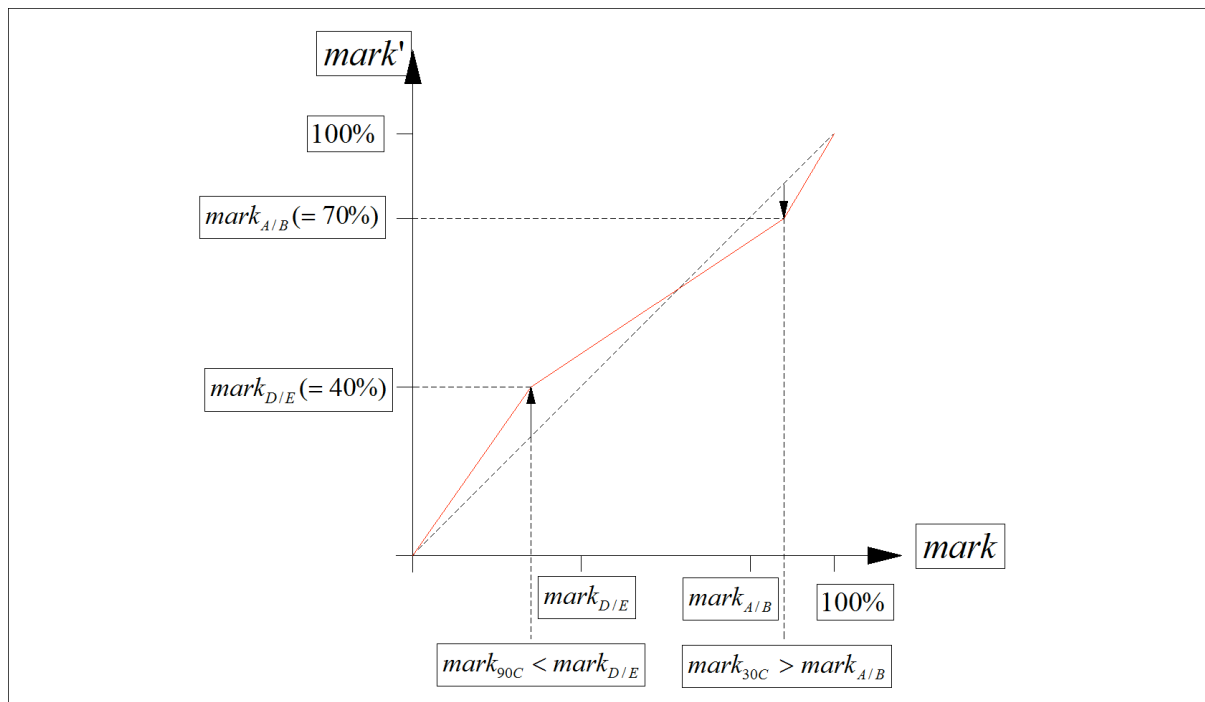$$\text{then } mark' = mark \frac{mark_{D/E}}{mark_{90C}}$$

elseif $mark < mark_{30C}$

$$\text{then } mark' = mark_{D/E} + \left(mark - mark_{90C}\right) \frac{\left(mark_{A/B} - mark_{D/E}\right)}{\left(mark_{30C} - mark_{90C}\right)}$$

else

$$mark' = mark_{A/B} + \left(mark - mark_{30C}\right) \frac{\left(100 - mark_{A/B}\right)}{\left(100 - mark_{30C}\right)}$$

This process can be represented as a graph as follows:

If moderation is to be applied at the top only then the algorithm is

$$\text{If } mark < mark_{D/E}$$

$$\quad \text{then } mark' = mark$$

$$\text{elseif } mark < mark_{30C}$$

$$\quad \text{then } mark' = mark_{D/E} + \left(mark - mark_{90C}\right)\frac{\left(mark_{A/B} - mark_{D/E}\right)}{\left(mark_{30C} - mark_{D/E}\right)}$$

$$\text{else}$$

$$\quad mark' = mark_{A/B} + \left(mark - mark_{30C}\right)\frac{\left(100 - mark_{A/B}\right)}{\left(100 - mark_{30C}\right)}$$

If moderation is to be applied at the bottom only then the algorithm is

$$\text{If } mark < mark_{90C}$$

$$\quad \text{then } mark' = mark\frac{mark_{D/E}}{mark_{90C}}$$

$$\text{elseif } mark < mark_{30C}$$

$$\quad \text{then } mark' = mark_{D/E} + \left(mark - mark_{90C}\right)\frac{\left(mark_{A/B} - mark_{D/E}\right)}{\left(mark_{A/B} - mark_{90C}\right)}$$

$$\text{else}$$

$$\quad mark' = mark$$

Moderation of Module Marks between Optional Modules

We seek to adjust module marks if the module marks are judged to be abnormally high or low in the light of how those candidates taking the module performed in their other modules. All the department's own modules (i.e., not business, humanities or computing modules) that are taken by at least 4 EEE or EIE students (i.e., not including students from other departments or occasional students) are considered for potential moderation through the following steps.

1. The module average for all EEE/EIE candidates sitting the exam is calculated and termed the inclusive average (A_{Inc}) for that module.

2. The average mark for all the other modules taken the EEE/EIE candidates s taken the module is question is calculated and termed the exclusive average (A_{Exc}). This is sum of all the marks for all the other EE exams sat by the EEE/EIE candidates divided by number of all the other EE exams sat by the EEE/EIE candidates.

3. If difference between the exclusive and inclusive averages is more than 6% then the module mark for every candidate (not only EEE/EIE candidates) is adjusted by half the difference (with limits applied at 0% and 100%). The moderated mark for every candidate becomes:

$$\text{If } abs(A_{Exc} - A_{Inc}) > 6$$

$$\quad \text{then } mark' = mark + \tfrac{1}{2}(A_{Exc} - A_{Inc})$$

$$\text{else}$$

$$\quad mark' = mark$$