

# Mathematics Finals Examination Board Procedures (2017-2018)

This document describes how the Mathematics Finals Examination Board implements the university's degree classification conventions.

1. **The University's regulations** governing the award of BSc and MMath degrees can be found in the University Calendar, Regulation 8.3, with options available in the case of examinations missed for medical reasons described in Regulation 12. See [www2.warwick.ac.uk/services/gov/calendar/section2/regulations/](http://www2.warwick.ac.uk/services/gov/calendar/section2/regulations/)

2. **The University's undergraduate degree classification conventions** can be found at [www2.warwick.ac.uk/services/academicoffice/quality/categories/examinations/conventions/ug08/](http://www2.warwick.ac.uk/services/academicoffice/quality/categories/examinations/conventions/ug08/) Throughout this document, these conventions will be referred to as UDCC08.

The Department of Mathematics is part of the Faculty of Science and therefore, Articles 2(e) and 2(f) of Section II of UDCC08 apply. These are summarised in 4 below.

3. **Degree Class Borders.** [UDCC08, II.1]. The degree class awarded is provisionally determined (see 7 below) by consideration of the overall percentage credit (see 6 below) achieved by the candidate. This provisional classification will correspond to percentages as agreed by the Senate:

First Class Honours: 70% and above

Upper Second Class Honours: 60-69.9%

Lower Second Class Honours: 50-59.9%

Third Class Honours: 40-49.9%

Pass Degree (not Honours): 35-39.9%

Fail: 0-34.9%

There is no Pass degree on the MMath; see 10 below.

4. **Minimum credits in Final Year.** [UDCC08, II.2(f)]. In respect of students in the Faculty of Science who joined Warwick from Autumn 2011 or later, the following shall apply:

(a) For an Honours degree (whether of three or four years duration), a candidate must pass (at the 40% module pass mark) in the final two years contributing to the degree classification, whole modules equating to at least 168 credits in total, including at least 80 credits taken in the final year.

(b) For a Pass degree (whether of three or four years duration), a candidate must pass (at the 40% module pass mark) in the final two years contributing to the degree classification, whole modules equating to at least 150 credits in total, including at least 50 credits taken in the final year.

5. **Calculation of overall year mark.** [UDCC08, I.3].

In year  $n$  of study, a student obtains an overall year mark  $S_n$ . This is calculated as follows.

In respect of students in the Faculty of Science who joined Warwick before Autumn 2013 the Seymour Formula rewards students who take more than the normal load of 120 CATS (up to a maximum of 150 CATS). It is used for calculating each year's overall mark,  $S_n$  in year  $n$ , and it is defined as follows:

Let  $M_n$  denote the set of modules taken in year  $n$ . If the score in module  $m$  in  $M_n$  is  $p(m)\%$  and module  $m$  is worth  $c(m)$  CATS, let

$$L_n := \sum_{m \in M_n} c(m), \quad \text{the total number of CATS taken, i.e. the load,}$$

$$X_n := \sum_{m \in M_n} c(m)p(m),$$

$$N := \text{number of CATS on the normal load (currently 120),}$$

$$A_n := \frac{1}{2}(L_n + N \times \max\{1, L_n/150\}).$$

Then

$$S_n := X_n/A_n.$$

Note that if the load is less than or equal to 150 CATS then,

$$S_n = X_n/(N + \frac{1}{2}e_n) = X_n/(L_n - \frac{1}{2}e_n),$$

where  $e_n = L_n - N =$  the difference between the load taken and the normal load.

In respect of students in the Faculty of Science who joined Warwick from Autumn 2013 or later, the following shall apply for each year of study:

*The overall end of year mark will be calculated as the straight average on the subset of modules fulfilling regulations that gives the highest mark (or straight average on all modules taken if that is higher).*

I.e. The overall end of year mark in year  $n$ ,  $S_n$ , will be calculated as follows. Let  $M$  denote any subset of the modules taken in year  $n$ . If the score in module  $m$  in  $M$  is  $p(m)\%$  and module  $m$  is worth  $c(m)$  CATS, let

$$L(M) := \sum_{m \in M} c(m),$$
$$X(M) := \sum_{m \in M} c(m)p(m).$$

Then  $S_n$  is the maximum of  $X(M)/L(M)$  taken over all subsets of modules fulfilling regulations.

In respect of students who joined Warwick before Autumn 2013, but have had a period of temporary withdrawal and so are being compared against a cohort which started in Autumn 2013 or later, we calculate both of the end of year averages above for year 3 and take the higher of the two.

6. [Course regulations at <http://web.warwick.ac.uk/info/courseregs/201314/UMA.htm>]

A candidate's **overall percentage credit**  $C$  is determined by

$$C = (10S_1 + 30S_2 + 60S_3)/100$$

for the BSc (Mathematics) degree, and

$$C = (10S_1 + 20S_2 + 30S_3 + 40S_4)/100$$

for the MMath degree, and

$$C = (10S_1 + 20S_2 + 20S_3 + 50S_4)/100$$

for the MMath with Study in Europe degree. Marks  $S_n$  and  $C$  are normally presented to the Board rounded to one decimal place. Joint degree courses with Philosophy, Economics and Business Studies are considered by other Finals Boards which may use different conventions and weightings.

7. **Classification** takes place in two stages. *Provisional classification* (this section) is automatic. *Final classification* (next section) takes place only after detailed consideration of borderline candidates.

*Provisional classification* is based on the class borders in 3 above together with the requirement that: a candidate must achieve marks in that provisional class or higher in whole List A, List C or List D modules, equating to at least 48 CATS in total, taken in the final two years. This is to fulfil II.3 of UDCC08. Furthermore, suppose that a candidate's cumulative credit is  $C$ , that the class borderline under consideration is  $B$  and that  $C < B$ .

- (a) (Rounding) If  $C \geq B - 0.5$  then the candidate is provisionally placed in the higher class.
- (b) (Effect of final year — BSc) Candidates for a BSc are provisionally placed in the higher class if they satisfy all of the following conditions

- i.  $C \geq B - 2$ ,
  - ii.  $S_3 \geq B$ ,
  - iii. EITHER  $B = 70$  and the marks in the best 45 CATS from List A Year 3 or Year 4 modules taken in the final year are at least 70  
OR  $B \leq 60$ , and the marks in the best 30 CATS from List A Year 3 or Year 4 modules taken in the final year are at least  $B$ .
- (c) (Effect of final two years — MMath) Final year candidates for the MMath whose cumulative credit  $C \geq B - 2$ , whose final year  $S_4 \geq B$ , and who have scored marks of  $B$  or above in at least 60 CATS worth of modules from List C or List D (including Project MA4K8 or MA4K9) or 45 CATS worth of modules from List C or List D (not including Project MA4K8 or MA4K9), in either third or fourth year, are provisionally placed in the higher class.

Note that the Seymour formula does not apply to module marks; its sole purpose is for the calculation of  $S_n$ , the credit for year  $n$ . In particular, the module marks referred to in 7 (b) iii, 7(c) and 9 below are *not* adjusted by the Seymour formula.

8. [UDCC08, III.1] The Board of Examiners will determine the final classification of candidates. It may use its academic judgement to award a degree class that is different from that determined under the preceding section, but it must minute its reasons for doing so.
9. The provisional classification of a candidate by the procedure in 7 may change if the candidate is considered borderline. **Borderline cases** shall include, but are not limited to, cases where  $68 \leq C \leq 71$  or  $B - 2 \leq C \leq B$  and  $B \leq 60$ . In particular, candidates provisionally placed in the higher class by virtue of (a), (b) or (c) in 7 are borderline cases. In considering borderline cases for final classification the following factors may be taken into consideration.
- (a) The profile of marks in the three years, or performance in a subset of exams showing ability above the standard required for the class.
  - (b) The relative performance in Mathematics (List A for BSc) and Non-Mathematics modules.
  - (c) [*Factors considered by the examination board at*  
<http://www2.warwick.ac.uk/fac/sci/math/undergrad/ughandbook/course/assessment>]  
To be awarded a first class BSc degree it is normally necessary to obtain good quality marks on a number of third (or higher) year Mathematics modules. This is normally interpreted to mean that at least 45 CATS of List A Year 3 modules, or List C or D Year 4 modules, should be above 70%. Similarly, for the award of MMath with First Class Honours, at least 60 CATS worth of modules from List C or List D (including Project MA4K8 or MA4K9) or 45 CATS worth of modules from List C or List D (not including Project MA4K8 or MA4K9), should normally be above 70%.
10. Final year candidates for the MMath scoring below the Honours standard (on the basis of the degree class borders in 3 above or the Minimum Credits in Final Year in 4 above) cannot be awarded an MMath Pass Degree. Instead they are considered for the award of a BSc degree with or without honours.
11. [UDCC08, I.5] Candidates for the BSc not awarded honours are considered for the award of a Pass Degree. For such candidates, an alternative cumulative credit  $D$  is calculated by replacing  $S_2$  and  $S_3$  in the formula for  $C$  in 6 above by  $X_2/L_2$  and  $X_3/L_3$  respectively. A pass degree is normally awarded when the maximum of  $C$  and  $D$  exceeds 35%. Note that  $X_n/L_n > S_n$  (which is necessary for  $D$  to be greater than  $C$ ) if and only if  $L_n < N$  i.e., this only benefits students who take less than the normal load, which is what we encourage for the Pass degree.
12. Pass degree candidates will be considered for an Honours degree if the overall percentage mark  $C$  achieved is 40% or above. As in 6 above,  $C$  is calculated using  $S_1$ ,  $S_2$  and  $S_3$ . (So candidates who

have taken less than the normal load need to be averaging more than 40% to be awarded an Honours degree. Of course, this applies to all students, not just those on a Pass Degree, but it is usually only relevant to the latter.)

13. Candidates with documented evidence of ill-health, psychological problems or other matters seriously disrupting their studies are considered by a mitigating panel prior to the meeting of the Finals Examination Board. The Board will then consider those cases where the panel recommends a different classification from that recommended by the Board without taking the mitigating circumstances into account.
14. Vivas are not held.
15. MMath students in their third year of study with  $S_3$  less than 55% or whose score in their best 90 CATS of MA3 and MA4 modules is less than 55%, will normally be considered for the award of a BSc (classified according to the procedures described above) and not permitted to proceed to the 4<sup>th</sup> year.
16. For 2017/18 the following non-MA coded modules have been deemed to have a high mathematical content and to be included in either List A for BSc finalists or List C for MMath finalists:

(a) List A for 3rd year BSc students:

- ST339 Mathematical Finance (15 CATS)
- ST411 Dynamics Stochastic Control (15 CATS)
- ST318 Probability Theory (15 CATS)
- CS301 Complexity of Algorithms (15 CATS)
- CS341 Advanced Topics in Algorithms (15 CATS)
- CS409 Algorithmic Game Theory (15 CATS)
- PX366 Statistical Physics (7.5 CATS)
- PX384 Electrodynamics (7.5 CATS)
- PX390 Scientific Programming (7.5 CATS)
- PX392 Plasma Electrodynamics (7.5 CATS)
- PX420 Solar Magnetohydrodynamics (7.5 CATS)
- PX423 Kinetic Theory (7.5 CATS)
- PX425 High Performance Computing in Physics (7.5 CATS)
- PX436 General Relativity (7.5 CATS)
- PX408 Relativistic Quantum Mechanics (7.5 CATS)
- PX430 Gauge Theories for Particle Physics (7.5 CATS)
- ES3C8 Systems Modelling and Control (15 CATS)

(b) List C for 3rd/4th year MMath students:

- PX408 Relativistic Quantum Mechanics (7.5 CATS)
- PX425 High Performance Computing in Physics (7.5 CATS)
- PX430 Gauge Theories for Particle Physics (7.5 CATS)
- PX436 General Relativity (7.5 CATS)
- ST411 Dynamics Stochastic Control (15 CATS)
- ST417 Topics in Applied Probability (15 CATS)