

Part IB CATAM

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- CATAM manual: <http://www.maths.cam.ac.uk/undergrad/catam/II>
- Find these slides (PDF with links) at the CATAM webpage <http://www.maths.cam.ac.uk/undergrad/catam>
- Helpline: catam@maths.cam.ac.uk

What is CATAM?

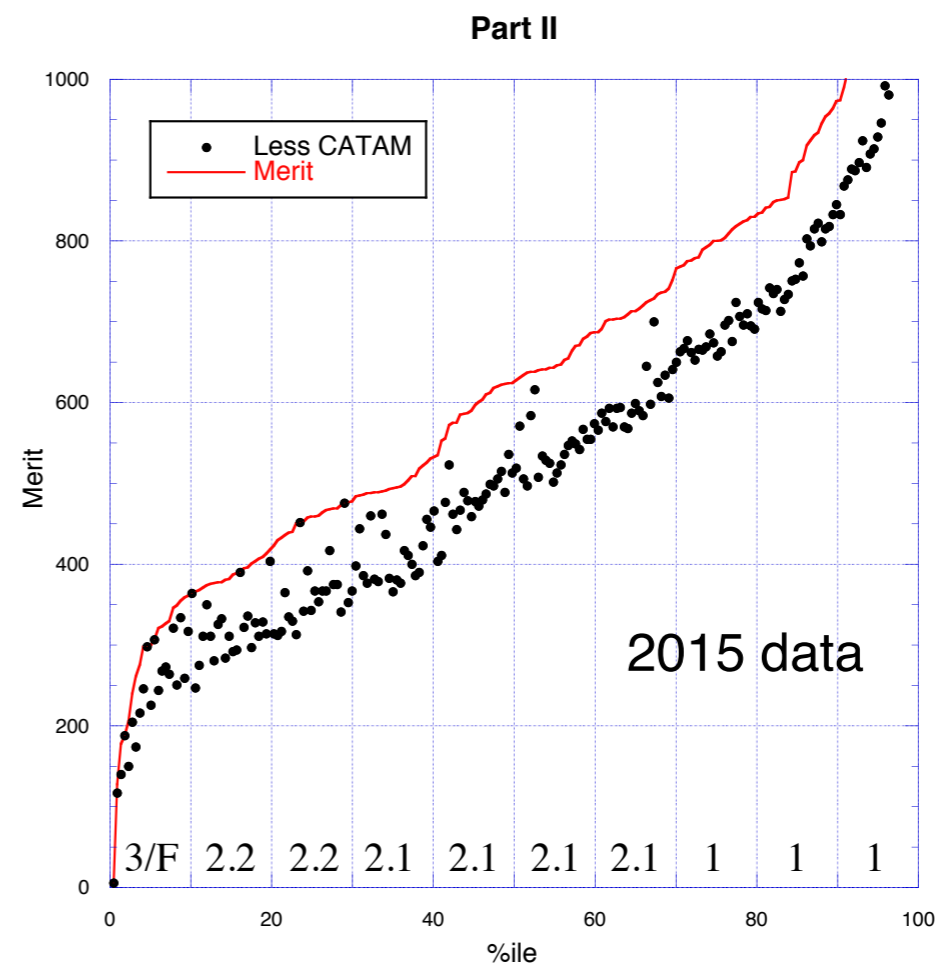
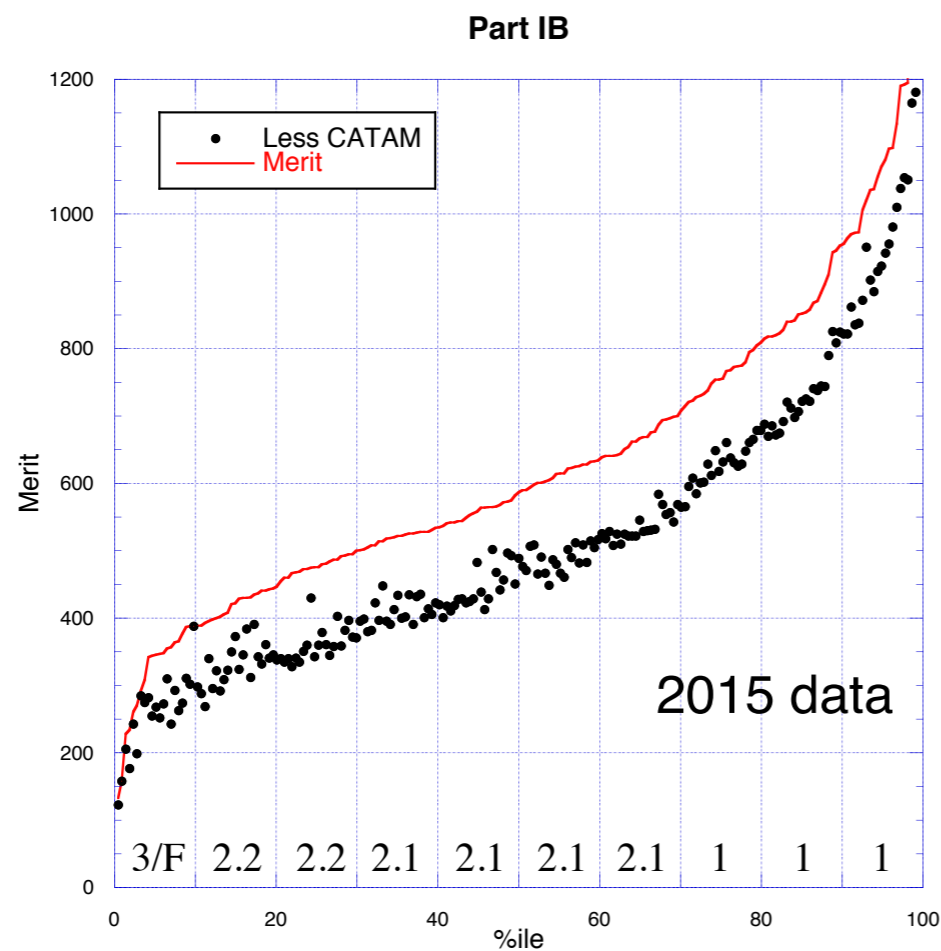
Computer-**A**ided **T**eaching in **A**ll **M**athematics

- Has been part of the Tripos since 1969
- Another way to *teach* and *learn* mathematics
- Significant number of Tripos marks available for CATAM
- Increasingly, academic and industrial maths relies on computing

see Schedule and CATAM manual for more detail

Marks available — Part IB

- Maximum of 160 Tripos marks
- For the average student, CATAM contributes ~20% of merit marks
- Credit added directly to marks total: no α or β 's



see [Schedule](#) and [CATAM manual](#) for more detail

2023/2024 projects - Part IB

Introduction

Optional Introductory Non-Examinable Project

0.1 Root Finding in One Dimension

Core Projects

1.1 Random Binary Expansions

1.2 Ordinary Differential Equations

Additional Projects

2.1 The Restricted Three-Body Problem

2.2 Parallel-Plate Capacitor: Laplace's Equation

2.3 Curves in the Complex Plane

2.4 Sensitivity of Optimisation Algorithms to Initialisation

For maximum credit, you should attempt both projects from section 1 (*Core Projects* above), and then two additional projects chosen from section 2 (*Additional Projects*). You may not attempt more than two additional projects. All projects carry equal credit.

see [CATAM manual](#) for more detail

Marking

- 20 raw marks available for each project
- 8 marks for computing
- 10 marks for mathematics (i.e. theory)
- 2 marks for excellence
 - e.g. for mathematical clarity, clear and concise text, well-formatted figures (include axis labels!)

Deadlines — Part IB

- **Core: Tuesday 23 January 2023, 4pm**
- **Additional: Tuesday 30 April 2023, 4pm**
- There are many reasons to work diligently and finish well ahead of deadline
 - to deal with unforeseen problems including graphs, tables, program listings
 - to *proofread* your submission
 - to have ample time to upload report to Moodle

see [CATAM manual](#) for more detail

To MATLAB or not to MATLAB...

- MATLAB makes computational maths easy
- You don't have to learn to be an ace programmer
- There are lots of other options, including
 - Python, Julia, R, C++, etc.
- You can use these languages and others for CATAM*
- The University Information Services (UIS) offers short courses in C++, python, R, and MATLAB: <http://www.ucs.cam.ac.uk/training>

*Ask helpline if an in-built function makes question/task trivial

see [CATAM manual](#) for more detail

Openendedness

- Unlike tripos questions, CATAM projects often have open-ended questions, e.g. invitations to comment
- This is deliberate
- Figuring things out for yourself is a “transferable skill”
- Frustration might actually be *productive discomfort* (think: yoga, strength/athletic training, music practice, essay writing)

see [CATAM manual](#) for more detail

Communicating mathematics

- Clear, concise writing is a “transferable skill”
- Proofread for typos & mistakes
- Re-read, imagining you are not the author:
 - Would you like to read your write-up?
 - Would you learn any mathematics from it?

Academic integrity

- All of you work very hard studying mathematics
- You have earned an examination procedure which respects your efforts
- Achievement of tripos marks by unfair means is an insult to all of you
- We promise to protect the academic integrity of CATAM

Unfair means

Unfair means includes (but is not limited to):

- Copying any person's program
- Using someone else's program or any part of it as a model, or working from a jointly produced detailed program outline
- Using generative AI (ChatGPT, Bing, Bard, etc) to produce some or part of write-up or source code
- Copying or paraphrasing someone else's report in whole or in part
- Posting questions on the internet, e.g. StackExchange
- Sharing your work with other students (including future years)

If in doubt, contact us via catam@maths.cam.ac.uk

see [CATAM manual](#) for more detail

Plagiarism detection

- Unfortunately, upholding Academic Integrity means we all have to undertake some administrative tasks
- Submit **code/programs electronically**
 - Comparison with projects submitted this year *and previous years*
- Produce & submit **write-up electronically**
 - Checked against Turnitin database
 - Source code checked with MOSS
- Student declaration form (e-mail to be sent soon)

see CATAM manual for more detail

Consequences of unfair means

From the manual:

If the Chair of Examiners deems that unfair means were used, the case may be brought to the **University courts**. According to the Statues and Ordinances of the University ¹⁴

suspected cases of the use of unfair means (of which plagiarism is one form) will be investigated and may be brought to one of the University courts or disciplinary panels. The University courts and disciplinary panels have wide powers to discipline those found to have used unfair means in an examination, including depriving such persons of membership of the University, and deprivation of a degree.

If you assist someone else in using unfair means (e.g. by providing your report or computer code), you may also be subject to discipline.

see [CATAM manual](#) for more detail

Returning from intermission

- If you are returning from intermission that began in an academic year when you submitted some or all of CATAM projects, then you might be able to use some/all of your previous marks.
- **Important:** discuss your options with your DoS.
- Your DoS will need to contact catam@maths.cam.ac.uk and the Undergraduate Office to discuss the chosen approach.
- You must do this **before** the submission deadline.

Electronic submission

- Submit your code and write-up electronically
- Free to produce your write-up using
 - LaTeX — see LaTeX guide
 - Microsoft Word
 - LibreOffice/OpenOffice
 - most any word processor (see CATAM manual)
- ***Not permitted:*** anything scanned

Resources

- MATLAB guide and online booklet
- CATAM manual
- CATAM LaTeX guide, LaTeX intro slides from Stephen Eglén
- CATAM FAQ
- Helpline: catam@maths.cam.ac.uk
- Lecture on the introductory project
- Model solutions to the introductory project will be provided later in Michaelmas term
- Ask your DoS to arrange a supervision on introductory project, or on core projects *after* you receive the marks back

Please see CATAM manual

For any questions, contact

CATAM helpline:

catam@maths.cam.ac.uk

Have a great year!