IB CATAM Introduction

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

NB: the information in these slides should be up to date, but if in doubt please check the CATAM manual for official lists / deadlines / etc.

Why CATAM?

Computer-Aided Teaching in All Mathematics

- Another way to teach and learn mathematics
- Lots of academic and industrial maths relies on computing
- Significant number of Tripos marks available for CATAM

Marks available — Part IB

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

2021/2022 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 Linear Regression — Autocorrelation

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.
Deadlines — Part IB

- **Core:** Tuesday 25 January 2022, 4pm
- **Additional:** Tuesday 3 May 2022, 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

MATLAB

- MATLAB makes computational maths easier
- You don’t have to learn to be an expert programmer.
- You **can** learn to be an expert programmer!
  - Lots of online resources available, you can pick your language (python, C, Matlab, ...)
  - Another option: Julia - Matlab-like ease with C speed
- You can use these languages and others for CATAM*

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

see CATAM manual for more detail

Open-endedness

- 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
- 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 UK database
- 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 Statutes and Ordinances of the University, 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
Electronic submission

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

Resources — Part IB

- MATLAB guide and [online booklet](#)
- CATAM manual
- [CATAM LaTeX guide](#)
- [LaTeX intro slides](#) from Stephen Eglen
- CATAM FAQ
- Helpline: [catam@maths.cam.ac.uk](mailto:catam@maths.cam.ac.uk)
- Ask your DoS to arrange a supervision on introductory project, or on core projects *after* you receive the marks back
- Lecture on introductory project:
  - Watch e-mail & CATAM page [http://www.maths.cam.ac.uk/undergrad/catam](http://www.maths.cam.ac.uk/undergrad/catam)
- Library
- Computer room: GL.04 (Basement of Pav. G in CMS)

**Have a great year!**