IB CATAM Introduction

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- CATAM manual: 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

- Helpline: catam@maths.cam.ac.uk
Why CATAM?

Computer-Aided Teaching in All Mathematics

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

see Schedule and CATAM manual for more detail
Marks available — Part IB

- Maximum of 160 Tripos marks
- For the average student, CATAM contributes \~20\%
- Credit added directly to marks total: no \(\alpha\) or \(\beta\)’s

See Schedule and CATAM manual for more detail.
2020/2021 projects - Part IB

Introduction

Optional Introductory Non-Examinable Project

0.1 Root Finding in One Dimension

Core Projects

1.1 Matrices over Finite Fields
1.2 Ordinary Differential Equations

Additional Projects

2.1 The Diffusion Equation
2.2 Schrödinger’s Equation
2.3 Non-Euclidean Geometry
2.4 Simulation of Random Samples from Parametric Distributions

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
Deadlines — Part IB

- **Core**: Tuesday 26 January 2021, 4pm
- **Additional**: Tuesday 4 May 2021, 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 ace programmer.
• You *can* learn to be an ace programmer!

  ‣ The University Information Services (UIS) offers short courses in C++, python, R, and MATLAB: http://www.ucs.cam.ac.uk/training

  ‣ 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
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 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 Statues 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

- 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

- Library

- Computer room: GL.04 (Basement of Pav. G in CMS)
Have a great year!