Understanding Cambridge Academics
Cambridge – need to start early

- Very quirky organization by subject – decentralized and can be hard to find class descriptions as some are behind firewalls.
- START EARLY, e.g., NOW if you want to apply to Cambridge. You really need to dig into the subject/tripos you will apply in and understand the system!
- Complete regular Study Abroad Application
Cambridge –

*Is this a good option for you?*

- You need to have a strong academic record – grades count in all the programs, but especially so at Cambridge.
- A **minimum** of 3.6 *cum* is required but **3.7 GPA & up in your option.**
- Is the academic fit a good one for you? Don’t apply to Cambridge solely because of social reasons! You need a strong academic fit.
- Do you have strong ref letters from instructors your option? This is particularly important.
Cambridge –
Is this a good option for you?

• Supervisions – *are you willing to speak up and engage in lively intellectual conversation with the supervisor?*

• *Supervisions* involve 1 supervisor to 2 or 3 students. *You need to be someone who speaks up and does not worry about whether you are “getting the answer correct!”*
Cambridge –
Is this a good option for you?

• Are you socially confident?
• Are you articulate?
• Do you keep up with the world news and like discussing world events?
• Can you relate well to students majoring in non-science/engineering disciplines such as literature, philosophy, history, etc.?
• Are you fussy about what you eat as you will often eat in the “Hogwarts” dining hall of your college?
Cambridge GPA Advisory

- Cambridge: 3.7 and up in option classes related to your tripos classes & min 3.6 cum
- Math at Cambridge 3.8+. Best to have taken Analysis for Part II
- Chemistry Part III – need 3.8+. These are master’s level classes – need Part II background.
How Actual Cambridge Students Are Admitted

• Regular degree undergrads are NOT admitted by a central university committee as at US universities — students are admitted by a college in a specific tripos/subject area!

• Students apply to a college. College faculty (fellows) select applicants to interview and test. Interviews are academic — not about personal fit. This is about academic fit.

• Students are selected based on A level & college test scores, references, & the interview — faculty run process.
Tripos/Subject

Chemical Engineering
Computer Science and Technology
Engineering
Natural Sciences*
Mathematics

*Natural Sciences Tripos contains multiple subjects...
You can only take courses in your tripos/subject.

One exception: In the Natural Sciences Tripos there are interdisciplinary classes for Physics, Earth Sciences, & Chemistry for Lent Term only.
Typically, parts are split up as follows:

- **Part 1A** – 1\(^{st}\) year
- **Part 1B** – 2\(^{nd}\) year
- **Part II**
  - **Part IIA** – 3\(^{rd}\) year
  - **Part IIB** – 4\(^{th}\) year
- **Part III**

You can mix parts, just beware of ‘schedule clashes’.
Limited Tripos & Subject

• At Cambridge you CANNOT TAKE CLASSES IN SOCIAL SCIENCE OR HUMANITIES Departments! No exceptions – Cambridge rule! A few tripos subjects offer electives, e.g., Engineering, that have language or BEM/Econ classes.
Tripos Info

• In some tripos areas, the subject is the same as the tripos, e.g., ChemE or CS.
• In NatSci or Engineering, there are subsets of subjects.
• In the Natural Sciences you choose ONE subject, e.g., PDN, Neuroscience, Earth Science, Chemistry, Physics, Math, etc., with exception of max of 1 interdisciplinary class in Lent. **Cannot do Materials or Biochemistry**
Cambridge Colleges

• Each of the thirty-one Colleges is an autonomous corporation & is self-governed.
• 16 “old” colleges, founded between 1284 and 1596, and
• 15 “new” colleges, founded between 1800 and 1977.
• Three for women only & **Darwin** only admits only postgraduates
U. Cambridge Colleges

- We partner with 4 of the old colleges:
  - Pembroke — founded 1347
  - Corpus Christi — 1352
  - St. Catharine’s — 1473
  - St. John’s — founded 1511
- You cannot pick your college.
Role of the Colleges

• The elected or appointed Head of a College may be termed Master, President, Principal, Mistress, Provost, or Warden.

• The Governing Body is made up of the Head and some or all of the Fellows - the elected senior members of the College whose primary duty is teaching, administration or research.
The Role of the Colleges (cont.)

- Residential system – member only of your college.
- Lots of rules & traditions!
- Exeat Rule example.
- Much more scrutiny of your behavior and high standard expected.
You must have a 2\textsuperscript{nd} choice program

- Michaelmas (fall) – 6 places
- Lent (winter) – 4 places
- Apply to both to maximize selection to Cambridge, BUT you still need to apply to a program other than Cambridge! No exceptions.
- If you don’t get Cambridge, you don’t have to study abroad, but you’d be missing out!
University & Departments

- 100 academic departments organized into six schools.

- They are:
  - Arts and Humanities
  - Biological Sciences
  - Clinical Medicine
  - Humanities and Social Sciences
  - Physical Sciences
  - Technology
Or Lent Term?
Winter Becomes Spring in Lent!
Apply for both terms if you are serious about Cambridge

• Look at classes for best match.
• Both Michaelmas and Lent have their charms!
2nd Choice Options

- **Copenhagen**: DTU & UCPH
  - DTU works for engineering and most natural sciences & applied math.
  - UCPH for physics, biology, CS and math.
2nd Choice Options

- **Edinburgh** has the same feel to it as Cambridge – ancient university in a beautiful, walkable, small city, great academics that work for most options, i.e., CS, ME, EE, Physics/Astrophysics, GPS options, Biology, Chemistry, ChemE, Math, etc.

- You can take HSS classes – 1 or 2
2nd Choice Options
Want Old: Edinburgh – Founded 1583

TEVIOT UNION
FOUNDED 1889
2\textsuperscript{nd} Choice Options

If UCL is your 2nd choice look carefully at the admitting department 1\textsuperscript{st} and 2\textsuperscript{nd} year classes so you meet prerequisites.

- **UCL**: only an hour away from Cambridge!
  - Only allow fall students in biological sciences, chemistry, geology, mechE and neuroscience.
  - Can take HSS courses (up to 50\% of classes)

- **No** Math/ACM, EE, Physics, or BioE or Chem E
2nd Choice Issues

• All Edinburgh & UCL programs have a supervision-like system (tutorials)
• DTU and KU have recitation sessions as part of block system
All Bachelors Degrees are 3 Years Long in England

All Engineering and some Science degrees have an optional 4th year (coursework masters), which is equivalent to a class at the 100 level.
Natural Science (Natsci) Tripos

• Physics & Astronomy - Parts II or III
  - Math is its own tripos, and includes Applied Math
  - Experimental and Theoretical Physics or DAMTP: Physics & Math overlap (Physics students may be able to take some Maths Part II classes)
  - Astronomy students may take physics classes & vice versa

• Chemistry – Part III only & very challenging for jrs
  - ChemE is a separate tripos (you can’t mix them)
  - No biochemistry – no exceptions  No work assigned – just lectures.

• Geological Sciences - Parts II or III (classes alternate by year)
  - Ok to take field courses for field credit

• Interdisciplinary Classes - Part III
  - Limited to Chemistry, Geological Sciences, or Physics. You can propose up to 2 of these- but check schedule carefully for time conflicts with your subject.

Go to: https://fasa.caltech.edu/studyabroad/programs/cambridge
Natural Science (Natsci) Tripos

- Mathematics – Part IA, IB, or II only. Have C & D level classes. D much harder! (There is no separate applied math dept. Applied math is in math

NO PART III CLASSES ALLOWED in Maths! (Can audit for fun)

- Biological Subjects - Part Ib and II only
Biological Sciences

• Natural Sciences Tripos
  – Biology: Part II preferred. Some IB allowed.
    • Neuroscience, PDN, Plant Sciences, Zoology-one only
    • Writing more than 1 well researched & well written essay per week
    • Choose 4 classes
    • Must be excellent time manager - student arranges supervisions
    • **NOT ALLOWED**: anatomy, biochemistry, clinical or veterinary medicine, genetics, pathology, or pharmacology.
Mathematics Tripos
Includes Applied Math

• The Brits say “Maths”, not “Math”

• Take classes from Part II. You cannot take Part III classes that is a graduate program.

• There are some interesting “non-examinable” classes that you can attend, but will not get credit for because there is no assigned work, such as:
  - Topics in the History of Mathematics, Ancients to the Renaissance (Michaelmas)
  - Topics in the History of Mathematics, Renaissance to the 19th Century (Lent)

• Must have at least 16 lectures = 6 CIT units & 24=9
Chem Eng versus Engineering

• Most Chem Eng students have opted for the Engineering tripos. Some have selected Chemistry Part III – depends on your track in the Chemical Engineering option.

• Best to check classes in both the Chemical Engineering Tripos and the Engineering Tripos.

• NOTE that the Engineering Tripos has Information Eng, Materials & Bioengineering “Groups.”
Engineering Tripos

• You can take courses in Part IIA or Part IIB (3\textsuperscript{rd} or 4\textsuperscript{th} year), but must take at least 2 in IIA (IIB has no supervisions & max of 2 IIB). Classes are called MODULES.

• Has sub-groups such as:
  - Group A: Energy, Fluid Mechanics and Turbomachinery
  - Group B: Electrical Engineering
  - Group C: Mechanics Materials and Design
  - Group D: Civil & Structural Engineering
  - Group E: Management and Manufacturing
  - Group F: Information Engineering
  - Group G: Bioengineering
Engineering Tripos

• You can take 4-5 classes, but at least 2 out of 4 or 3 out of 5 must be “real” engineering courses (not management, languages, etc.)

• Has BEM type classes & Language classes.

IIA:
http://teaching.eng.cam.ac.uk/node/2979
(Look at Group E Management & Mfg
Examples of Part IIB Engineering elective classes

<table>
<thead>
<tr>
<th>Module Code</th>
<th>Title (linked to syllabus)</th>
<th>Term (set)</th>
<th>Prerequisites Assumed</th>
<th>On-line resources</th>
<th>Leader</th>
<th>Lab Leader</th>
</tr>
</thead>
<tbody>
<tr>
<td>3E1</td>
<td>Business economics</td>
<td>M(9)</td>
<td></td>
<td>Moodle</td>
<td>Dr A Rosato</td>
<td>Dr A Rosato</td>
</tr>
<tr>
<td>3E2</td>
<td>Marketing</td>
<td>M(9)</td>
<td></td>
<td>Moodle</td>
<td>Dr V. Mak</td>
<td>Dr V. Mak</td>
</tr>
<tr>
<td>3E3</td>
<td>Modelling Risk</td>
<td>L(8)</td>
<td></td>
<td>Moodle</td>
<td>Dr F Erhan-Oguz</td>
<td>Dr R. Zanjirani-Farahani</td>
</tr>
<tr>
<td>3E6</td>
<td>Organisational behaviour</td>
<td>L(8)</td>
<td></td>
<td>Moodle</td>
<td>Dr J Stollberger</td>
<td>Dr J Stollberger</td>
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<tr>
<td>3E10</td>
<td>Operations management for engineers</td>
<td>L(8)</td>
<td></td>
<td>Moodle</td>
<td>Dr F Erhan-Oguz</td>
<td>Rev R McKenzie</td>
</tr>
<tr>
<td>3E11</td>
<td>Environmental sustainability &amp; business</td>
<td>M(9)</td>
<td></td>
<td>Moodle</td>
<td>Prof J A Howard-Grenville</td>
<td>Prof J A Howard-Grenville</td>
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</table>
## IIB Group M Modules

<table>
<thead>
<tr>
<th>Module</th>
<th>Code</th>
<th>Title (linked to syllabus)</th>
<th>Term (set)</th>
<th>Form of assessment</th>
<th>Prerequisites</th>
<th>On-line resources</th>
<th>Leader</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>4M1</td>
<td>French</td>
<td>L(10)</td>
<td>Coursework</td>
<td></td>
<td>Moodle</td>
<td>Mr D. Tual</td>
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<tr>
<td></td>
<td>4M2</td>
<td>German</td>
<td>L(10)</td>
<td>Coursework</td>
<td></td>
<td>Moodle</td>
<td>Mr A Bleistein</td>
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<tr>
<td></td>
<td>4M3</td>
<td>Spanish</td>
<td>M(10)</td>
<td>Coursework</td>
<td></td>
<td>Moodle</td>
<td>Mr S. Bianchi</td>
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</table>
## IIB Group E Mgmt & Manufacturing

<table>
<thead>
<tr>
<th>Module</th>
<th>Code</th>
<th>Title (linked to syllabus)</th>
<th>Term (set)</th>
<th>Form of assessment</th>
<th>Prerequisites Assumed</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>4E1</td>
<td>Innovation and strategic management of intellectual property</td>
<td>M(9)</td>
<td>Coursework</td>
<td></td>
</tr>
<tr>
<td></td>
<td>4E3</td>
<td>Business innovation in a digital age</td>
<td>M(9)</td>
<td>Coursework</td>
<td></td>
</tr>
<tr>
<td></td>
<td>4E4</td>
<td>Management of technology</td>
<td>M(9)</td>
<td>Coursework</td>
<td></td>
</tr>
<tr>
<td></td>
<td>4E5</td>
<td>International Business</td>
<td>L(9)</td>
<td>Coursework</td>
<td></td>
</tr>
<tr>
<td></td>
<td>4E6</td>
<td>Accounting and finance</td>
<td>M(9)</td>
<td>Coursework</td>
<td></td>
</tr>
<tr>
<td></td>
<td>4E11</td>
<td>Strategic management</td>
<td>L(9)</td>
<td>Coursework</td>
<td></td>
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<tr>
<td></td>
<td>4E12</td>
<td>Project management</td>
<td>L(9)</td>
<td>Coursework</td>
<td></td>
</tr>
</tbody>
</table>
Engineering Continued

- IIA: http://teaching.eng.cam.ac.uk/node/2979
- IIB:
  - http://teaching.eng.cam.ac.uk/content/iib-course-information
- LOOK VERY CAREFULLY AT ENGINEERING – COULD BE BETTER FIT FOR CS, BioEng, CHEM ENG STUDENTS than the tripos that seems to match option.
Chemical Engineering

- You can take courses in Part IIA or Part IIB – senior electives and specialization

- Some classes split into 2 sections, meaning some finish after winter break. You cannot take these.

- Has themes such as:
  - process applications and systems
  - mathematical methods

- The syllabus is available by going to the FASA Cambridge Page: https://fasa.caltech.edu/studyabroad/programs/cambridge

- Many ChemE’s select the Engineering Tripos or can opt for Chemistry Part III
Computer Science and Technology

- Is a 3 year program. LOOK AT INFORMATION ENGINEERING in Eng Tripos. Could be better fit.
- You can take classes from any part, as long as there are no time conflicts.
- Part II is the 3rd year - equivalent to junior/senior
  - Part IA is ok, but likely too easy
  - Part IB is sophomore/junior level
- Must have at least 16 lectures to equal 9 CIT units.
- Classes are taught for various #'s of weeks.
CompSci Tripos Info

• Computer Science – CompSci is its own subject. Has lots of issues as classes are taught for as few as two weeks to as many as 8. You must have at least 3 classes taught at any time in the term – no clustering at the start, middle or end of term.

• Note: CS students should also look at Info Science Track in Engineering Tripos-but can’t “mix” with CompSci. One tripos ONLY!
CompSci Tripos Info

• Units of Assessment Classes – students can ONLY chose 2 max of these classes. They are have twice the workload of a regular class, have a final exam taken during the term.

• Go to this link to see the CompSci classes including the units of assessment type classes: https://www.cl.cam.ac.uk/teaching/1920/part2-75.html

• Limited Enrollment due to exam spots!
Units of Assessment Michaelmas Term

• Advanced Graphics & Image Processing
• Data Science: Principles and Practice
• Digital Signal Processing
• Multicore Semantics & Programming
• Natural Language Processing
Units of Assessment Lent Term

• Cloud Computing
• Mobile Robot Systems
• Probability and Computation
• Topics in Concurrency
All classes CST (Computer Science Tripos)

• Part II Classes – have supervisions
  • https://www.cl.cam.ac.uk/teaching/1920/part2-50.html

• https://www.cl.cam.ac.uk/teaching/1920/part2-75.html - includes units of assessment-see below

• Part II Units of Assessment-exams and no supervisions
  https://www.cl.cam.ac.uk/teaching/part2-units.html
Example of CS Schedule

<table>
<thead>
<tr>
<th>Course</th>
<th>Time</th>
<th>Lectures/Supervisions</th>
<th>Units</th>
<th>Part</th>
<th>Week</th>
</tr>
</thead>
<tbody>
<tr>
<td>Machine Learning and Bayesian Inference</td>
<td>TR11</td>
<td>16/4</td>
<td>9</td>
<td>II</td>
<td></td>
</tr>
<tr>
<td>Computer Vision</td>
<td>TR12</td>
<td>16/4</td>
<td>9</td>
<td>II</td>
<td></td>
</tr>
<tr>
<td>Computer Systems Modelling</td>
<td>MWF9</td>
<td>12/3</td>
<td>6</td>
<td>II</td>
<td></td>
</tr>
<tr>
<td>Topical Issues</td>
<td>MWF11</td>
<td>12/3</td>
<td>6</td>
<td>II</td>
<td></td>
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<tr>
<td>Databases</td>
<td>MWF12</td>
<td>12/3</td>
<td>6</td>
<td>IB</td>
<td></td>
</tr>
</tbody>
</table>
Cambridge Caveats

- You can take only take classes in one tripos/subject with exception of Natsci Lent only interdisciplinary classes (propose 2, take only 1)
- Cambridge has a shorter term than other study abroad programs (good and bad)
- Some timetables/syllabi are listed on CamCORS/Raven, a locked system, so you’ll have to write to the department for info or see if the FASA Office has a copy or has a copy posted online.
Cambridge Advantages

• The supervision system – but you need to be willing to engage!

• No Exams – but you still must learn and integrate material to be able to engage properly in supervisions where hard questions can be asked.

• Has fall or winter option (Michaelmas or Lent)

• It is a shorter term than other study abroad programs, both positive & negative & has residency requirements – no travel out of UK & limited to occasional daytrips or weekends
Cambridge Page

- Go to Cambridge Handout page first to get to specific departments and class lists:

- Direct links to classes by subject/tripos area:
  - https://fasa.caltech.edu/studyabroad/programs/cambridge
The Cambridge Timetable

https://www.timetable.cam.ac.uk/

This does not encompass all subjects & RAVEN firewall for some subjects! Always check FASA Cambridge Handout for subject links.
Course Info – getting complete info can be painful so start now

Natural Sciences Overview – go to specific subjects via Cambridge Program Page:
https://www.natsci.tripos.cam.ac.uk/contacts/course-websites

Computer Science:
https://www.cl.cam.ac.uk/teaching/1920/

Mathematics:
https://www.maths.cam.ac.uk/undergrad/course/coursesII.pdf
Course info continued

• Engineering
  – Part IIA:  
    http://to.eng.cam.ac.uk/teaching/courses/y3/index.html
  – Part IIB: 
    http://to.eng.cam.ac.uk/teaching/courses/y4/index.html
  – The Cambridge Handout – online at 
    lifes.aca.techna.edu is your best source for specific 
    class info – use the links provided.
Reference Letters – Cambridge prefers professors/instructors!

• Who can write for you?
  – Need at least one prof/instructor in your STEM option or highly related field for your 1st letter. (No Hum or SS letters.)
  
  2nd Letter:
  – Another Prof/Instructor in your option
  – Graduate TA’s in your option or related field
  – Post-Docs you have done research with you
  – Employers in STEM related areas-research related only
  – Research supervisors
  – Your advisor or option rep – OK if that professor has not taught you as long as they know you

Don’t know who to ask? Come talk to us.
Punting on the Cam
Questions?