MSc AI Orientation

2024–2025

Dr Rob Craven, MSc AI coordinator

robert.craven@imperial.ac.uk

My role: MSc AI coordinator

To answer questions and give advice about your degree as a whole:

- degree structure;
- timings;
- how your degree class (distinction, merit, pass) will be determined;
- advice and decisions on lateness of CW, etc.;
- a large pile of other issues. . .
- . . . and general advice about the MSc and your time here.

As a rule: if you have a question which isn't *obviously* for someone else, just ask me.

The MSc AI noticeboard has lots of information about your degree.

The noticeboard also links to even more information you will find useful.

How to get in touch with me

If you have a question or a problem I can help with:

- use the general MSc AI edstem board—
    - I monitor this closely and try to reply quickly;
    - it helps other people who might have the same question;
    - another student might know the answer or be able to give advice.
- email me, on robert.craven@imperial.ac.uk;
- send me a message on Teams;
- make an appointment—
    - I don't have 'office hours', but this is because I'm happy to meet at most times;
- drop in to Huxley 361—I'm often around!

Degree structure: components

The degree has eleven bits.

- Ten 'taught' modules:
  - Five compulsory:
    - Introduction to Machine Learning
    - Introduction to Symbolic AI
    - Python Programming
    - MSc AI Software Engineering and Group Project
    - Ethics, Fairness, and Explanation in AI
  - Five others, chosen by you ('selective' or 'optional'):
    - Choose *at most* one 'optional'.
- Individual project / internship.

(For the list of modules, see here, low down the page. Module names link to pages about them.)

Autumn and Spring Terms

These each have 11 weeks:

- Week 1: introductory talks, preliminary teaching, etc.
- Weeks 2–9: mostly, lectures and coursework.
- Week 10 is 'revision week'.
- Examinations in week 11.

After the end of term 2, you work on projects and (optionally) the internship.

Degree structure: term-by-term

Autumn term (October–December):

- Three compulsory modules:
    - Introduction to Machine Learning
    - Introduction to Symbolic AI
    - Python Programming
- Some free-choice modules—normally, two.
- Examinations for all these modules, except Python.
- Preliminaries on the Group Project (within the Software Engineering module:
    - introductory talk (November 13th, 12pm);
    - group formation and project selection (by end of November);
    - initial meeting with supervisors (before end of term).
- **Optionally**: preparations for the MSc AI internship.
    - Introductory talk (November 4th).

Degree structure: term-by-term

Spring term (January–March):

- Week 1:
    - *Python* test;
    - initial lectures/labs for the Ethics module.
- Compulsory modules:
    - SE lectures for the Group Project, work on the project itself;
    - Ethics, Fairness, and Explanation in AI.
- Remaining free-choice modules.
- Examinations for modules this term. (No exam for the Group Project or Ethics.)
- Individual project:
    - introductory talk (early January);
    - project selection (end of January).

Degree structure: term-by-term

Summer term and after (April–September):

- Group project deadline and presentations (first week of term).
- Individual project or internship.
  - Full-time, from second week of term.
  - Report deadline and presentations, early/mid September.

And then... the end!

Choosing modules (1)

Is it possible to take modules not for credit?

If the module *is* an option on the MSc in AI (see the list here):

- this is straightforward: subscribe at level 2 and you will get access to module materials;
- coursework can only be submitted and marked when you subscribe for credit (level 3).

If the module *is not* an option on the MSc in AI:

- this *may* be possible, but you should email the lecturers for the module. (Find them by searching for the module on teachdb.)

Choosing modules (2)

New module on the MSc AI this year:

Non-Euclidean Methods in Machine Learning

When choosing modules, bear in mind your CW load.

- taking more 'pure-CW' modules will lighten your load during the exam period, but make it heavier during the rest of term

For full information on the weightings of CW and exams for each module, see here.

Choosing modules (3)

How necessary is Mathematics for Machine Learning?

Decide for yourself. Material in it is presupposed by:

Deep Learning
Machine Learning for Imaging
Natural Language Processing
Statistical Information Theory

Each of these modules needs slightly different portions of the material.

If you're not familiar with the material in chapters 6–10 of the book, *Mathematics for Machine Learning*, and want to do one of the modules listed, you **might** wish to take the MML module.

My advice—check with the module lecturers.

Choosing modules (4)

What's the difference between:

Robotics

Robot Learning ?

Briefly:

- Robotics is an introduction to mobile robotics. Topics include sensing, localisation, robot movement.
  - No pre-requisites (beyond those for the MSc AI, and Python).
  - Practical labs with real robots, programmed in Python.
- Robot Learning involves the application of ML to the control of robotic bodies.
  - Part is advanced material on reinforcement learning—you should be familiar with the content of Reinforcement Learning. (Though the latter is not a 'formal' pre-requisite.)
  - You do *not* need to have taken Robotics, though it might help a little.

Choosing modules (5)

What's the difference between:

Computer Vision
Machine Learning for Imaging ?

Briefly:

- Computer Vision is an introduction to computer vision in general. Topics include image representations, edge detection, etc.—with a small amount of machine learning, for classification tasks.

- Machine Learning for Imaging, as the name suggests, concentrates on ML in image processing, and also looks in particular at applications in medical image analysis and object detection.
    - A *small* amount of the content of Computer Vision is presupposed in one bit of the module.
    - MSc AI students have often taken Machine Learning for Imaging without having done first the other module—and done very well!

Choosing modules (6)

This year, we're running one module jointly with Imperial College Business School—AI Ventures.

AI Ventures runs in term 2, and involves talks on entrepreneurship and good start-up practices, talks from people in industry, as well as practical work in pitching a startup idea.

Interested? Go to the introductory talk **this Wednesday, 2nd October, 11am**, in Huxley 144.

NB: this module is on a slightly different schedule—teaching starts part-way into term 2, and continues into revision week.

Subscribing to modules (1)

You're already subscribed (at level 3) to all your compulsory modules.

Subscription levels:

- 0: No interest in the module.
- 2: Access to module materials.
- 3: For credit (counts towards degree); submit CW and have it marked; take exams.

Subscription is at https://infosys.doc.ic.ac.uk/internalreg/.

Pay attention to clashing modules. If two modules have lectures timetabled at the same time, then their *exams* will be at the same time—you can't do both.

Subscribing to modules (2)

Credit registration is open now.

- **Subscribe at level 3 from now** for those modules you want to take for credit.
- Each time you update, you must enter a **complete** set of level-3 subscriptions (including for term 2).
- Credit subscription **freezes** from October 28th.
- Credit subscription **unfreezes** from January 6th. You can then change your level 3 subscriptions **for term 2 only**.
- Credit subscription closes **3rd February, 2025**.

Subscribing to modules (3)

Subscription looks like this:

Internship (1)

As an optional alternative to the individual project, you can take an **internship**.

- Based in a company / research organisation / other university.
- Can have more of an engineering focus than the individual project.
- Imperial has sourced some opportunities—database opens later this term.
- You can also pursue your own avenues—DoC will need to approve. (Get in touch with me to discuss.)
- The internship can be based anywhere—it's **your responsibiity** to ensure visa compliance.

There is a dedicated MSc AI internship manager:

- Dr Andreas Joergensen, a.joergensen@imperial.ac.uk

Internship (2)

Timeline:

- Early November: introductory talk.
- Early November: internship database available.
- Mid-January: deadline to secure a place.
- Early May to early September (4 months): internship.
- Mid-September: report hand-in, and presentation.

The deadline of finalising the internship by mid-January is to allow you to select and be allocated a standard individual project, instead.

If you have more questions, post them on the MSc AI Internship EdStem board, or make an appointment to see Dr Andreas Joergensen (a.joergensen@imperial.ac.uk).

Degree regulations (1)

These are the rules for whether you get a pass, merit or distinction, etc. Here is the official document. Please read it!

Weightings are by ECTS credits:

- Individual project / internship: 35 credits.
- MSc AI Software Engineering Group Project: 10 credits.
- All other modules (9 of them): 5 credits each.

To **pass** the MSc, in essence:

1. 90 ECTS credits. (Normally, at least 50% on each of the 10 taught modules. Some marks 40–49.99% may be allowed as 'compensated passes', at the discretion of the Board of Examiners; no mark below 40% is acceptable. Maximum of 15 credits as compensated passes.)
2. A weighted average of 50% or above across the degree.
3. at least 50% on the individual project / internship.

Degree regulations (2)

To pass **with distinction**:

1. pass the MSc;
2. a weighted average of at least 70% across the degree;
3. at least 70% on the individual project / internship.

To pass **with merit**:

1. pass the MSc (but without distinction);
2. a weighted average of at least 60% across the degree;
3. at least 60% on the individual project / internship.

Working together (1)

Working with each other is important:

- you learn from each other;
- it keeps motivation and ambition up;
- makes the degree more fun;
- useful for the group project and group coursework.

Be pro-active in meeting people from the MSc in AI!

Working together (2)

Some ways of being social I'd love to see:

- WhatsApp/facebook groups, for your cohort and for other MScs, etc. (Is there a WhatsApp group already?)
- MSc AI group on LinkedIn—add me and I will invite you to the group.
- Personal tutor meetings! First will be at 4pm, Tuesday 1st October, probably. Find your tutor on your teachdb entry—they should be in touch.
- Regular meetings for the entire cohort to get together.

Also:

- MSc AI introductory social, **5pm today, Huxley 341**. Pizza, food, and drinks will be served!
- MSc AI end-of-week-1 social, **6pm, Friday 4th October, Huxley 217**.

MSc AI parenting scheme

Some of the more informal advice in this talk is a partial distillation of feedback from last year's cohort.

They're eager to help you out even more.

The MSc AI parenting scheme semi-formalizes this. So far, 36/55 of you have signed up.

There are still a few more places available—the queue for them is FIFO.

Email me—robert.craven@imperial.ac.uk—if you want to take part!

'Meet your alumnus' talks

DoC MSc graduates return to give talks on their careers post-Imperial, and what they wish they'd known when they first graduated.

- Monday 14th October, Yoanna Peneva, MSc AI 2019/2020.
- Monday 18th November, Ludo Mitchener, MSc Computing AIML 2019/2020.

General advice (1)

The pace and intensity over the term varies *considerably*.

Sometimes you will have more than one assessed coursework due—sometimes large ones—at the same time. It can heap up.

- Consolidate the lecture material early, rather than waiting until a later point in the term.
- It isn't necessary to achieve perfection on every piece of coursework:
  - balance different pieces of CW (lack of time-management isn't a reason for deadline extensions);
  - the difference in marks gained by spending another 5 (10. . . 20. . .) hours on a piece of CW may be entirely negligible.
- Always double-check the submission deadline! (The date **and time**!)

General advice (2)

Your cohort has a diversity of academic and career backgrounds.

This is a strength: you'll learn from each other, and bring different skills to bear in your collaborative work.

You may find that others know a bit more than you at the outset—particularly in the non-bespoke modules, where you sit beside other degrees.

This will level out gradually, and is not a cause for concern.

It is absolutely fine to know nothing about AI or CS at the beginning of the degree. (The MSc AI is a 'conversion' degree and teaches from scratch.)

Thank you. Questions?