MSc AI Orientation

2023–2024

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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 306—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 (mid-November);
  - 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 (late October).

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. (Not 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 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 all lectures, tutorials—as well as be able to submit coursework and get graded for it.

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 modules on the MSc AI this year:

Computational Neurodynamics
Human-Robot Interaction
Software Engineering for ML Systems
Deep Graph-Based Learning
AI Ventures
Statistical Information Theory

Some of these are entirely coursework, with no exam.

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.—wit 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, 4th October, 12pm**, in HXLY 311.

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: Submit coursework for the module (and have it marked).
- 3: Take module for credit (counts towards degree); take any exams associated.

If you're not subscribed at level 3 for a module, it won't contribute to your degree—even if you've already submitted coursework for it.

Register at level 2 now for modules you want to take this term.

This will help us with room arrangements, and will give you access to the materials for the module in good time.

Subscribing to modules (2)

Credit registration (for level 3) typically opens at the start of November. There are then two deadlines:

- mid-November;
- mid-February.

By each deadline you do a *full* set of level-3 subscriptions.

Before the February deadline—after term 1 exam results—you can change your mind and make changes to your subscriptions.

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 (3)

Subscription looks like this:

Internship (1)

This year, 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.)
- To move forward with the internship, you need to be at **merit** level in the first-term exams.
- The internship can be based anywhere—it's **your responsibiity** to ensure visa compliance.

Internship (2)

Timeline:

- Late October: introductory talk.
- End of October: 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 EdStem board, or make an appointment to see me.

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: 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.

This implies:

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?)
- Personal tutor meetings! First will be at 12pm, Tuesday 3rd, 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 Social, **5pm today, Huxley 341**. Pizza, food, and drinks will be served!

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, 35/47 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!

AGI Safety reading group

Weekly meetings to discuss papers on long-term risk and AI safety.

For further information, email Rhys (who's ex-MSc AI) and Henrik:

francis.ward19@imperial.ac.uk (Rhys)
c.aslund19@imperial.ac.uk (Henrik)

Or just join the WhatsApp group!

icarl

Group for learning and networking with passionate top researchers and practitioners of ML in autonomous agents.

We welcome everyone! Not only experts in RL!

Teams code: **cjo1kug**

1 **Fortnightly RL reading group**

To understand together the latest papers about RL, autonomous agents and related topics

2 **Monthly seminars**

Our latest seminars:

AlphaDev
DeepMind

Outracing Gran Turismo Drivers
Sony AI

Animal AI Olympics
Cambridge

Applications of Computing in Industry

Technical presentations by companies, extra-curricular, designed to show how what you're learning is applied in current industrial practice.

See the list of talks. (Some are outside AI/ML.)

A good opportunity to chat to people from industry and broaden your network.

Some companies offering MSc AI internships will present (e.g., QRT).

First two on **Wednesday 4th October** in HXLY 308, at 13:30 and 14:30.

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.
- Many pieces of assessed CW are due at 7pm, **but some are not!** (Always double-check the submission deadline!)

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?