

## Basic details

|                                                     |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |                 |                                                         |
|-----------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------|---------------------------------------------------------|
| UID                                                 | <input type="text"/>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         | Cohorts covered | Earliest cohort<br><input type="text" value="2025-26"/> |
| Long title                                          | <input type="text" value="Design Thinking for AI"/>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |                 |                                                         |
| New code                                            | <input type="text" value="ELEC70123"/>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       | New short title | <input type="text"/>                                    |
| Brief description of module<br>(approx. 600 chars.) | <input type="text" value="In this module, you will learn about design thinking and how it can be applied to AI solutions. Design thinking is an umbrella term for different methods focused on creative and desirable solutions. This module tackles design thinking from a dual perspective: (1) a human-centric one where we learn about how design thinking is applied in business contexts, and (2) a method-centric one where we explore design thinking techniques to build innovative AI solutions and methodologies. You will work on challenging problems that require AI solutions, analyze different AI papers and then propose solutions to their challenges. Knowledge of machine learning and deep learning will be assumed"/> |                 |                                                         |
| Available as a standalone module/ short course?     | <input type="text" value="N"/>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |                 |                                                         |

## Statutory details

|              |                                        |                                         |                                              |             |
|--------------|----------------------------------------|-----------------------------------------|----------------------------------------------|-------------|
| Credit value | ECTS<br><input type="text" value="5"/> | CATS<br><input type="text" value="10"/> | Non-credit<br><input type="text" value="N"/> | HECOS codes |
| FHEQ level   | <input type="text" value="Level 7"/>   |                                         |                                              |             |

## Allocation of study hours

|                   | Hours                              |                                                                            |
|-------------------|------------------------------------|----------------------------------------------------------------------------|
| Lectures          | <input type="text" value="28"/>    |                                                                            |
| Group teaching    | <input type="text" value="0"/>     | <i>Incl. seminars, tutorials, problem classes.</i>                         |
| Lab/ practical    | <input type="text" value="0"/>     |                                                                            |
| Other scheduled   | <input type="text" value="0"/>     | <i>Incl. project supervision, fieldwork, external visits.</i>              |
| Independent study | <input type="text" value="97"/>    | <i>Incl. wider reading/ practice, follow-up work, completion of assess</i> |
| Placement         | <input type="text" value="0"/>     | <i>Incl. work-based learning and study that occurs overseas.</i>           |
| Total hours       | <input type="text" value="125"/>   |                                                                            |
| ECTS ratio        | <input type="text" value="25.00"/> |                                                                            |

## Project/placement activity

|                                |                                 |
|--------------------------------|---------------------------------|
| Is placement activity allowed? | <input type="text" value="No"/> |
|--------------------------------|---------------------------------|

## Module delivery

|               |                                             |       |                                                |
|---------------|---------------------------------------------|-------|------------------------------------------------|
| Delivery mode | <input type="text" value="Taught/ Campus"/> | Other | <input type="text"/>                           |
| Delivery term | <input type="text" value="Term 1"/>         | Other | <input type="text" value="Term 1 and Term 2"/> |

## Ownership

|                                 |                                                                                                          |
|---------------------------------|----------------------------------------------------------------------------------------------------------|
| Primary department              | <input type="text" value="Electrical and Electronic Engineering"/>                                       |
| Additional teaching departments | <input type="text" value="Management &amp; Entrepreneurship"/><br><input type="text" value="Computing"/> |

Delivery campus

White City

## Collaborative delivery

Collaborative delivery?

N

External institution

N/A

External department

N/A

External campus

N/A

## Associated staff

| Role          | CID | Given name  | Surname |
|---------------|-----|-------------|---------|
| Module Leader |     | Islem       | Rekik   |
| Module Leader |     | Christopher | Tucci   |
|               |     |             |         |
|               |     |             |         |
|               |     |             |         |
|               |     |             |         |
|               |     |             |         |
|               |     |             |         |
|               |     |             |         |

## Learning and teaching

### Module description

Learning outcomes

Upon successful completion of this module you will be able to:

1. Explore and compare different design thinking techniques in AI and business
2. Critically evaluate design thinking principles of modern AI models and methodologies
3. Apply design thinking techniques to design innovative AI solutions in solving real-world problems
4. Build and demonstrate a prototype that solves a real-world problem.

Module content

1. What is design thinking? Different approaches to human-centric and AI-centric design
2. Problem-solving and understanding a problem
3. Social science techniques for empathy
4. Design thinking in AI
5. Blending
6. Breaking
7. Bending
8. Reverse thinking
9. Brainstorming
10. Prototyping
11. Testing

Learning and Teaching Approach

This is a participatory module that combines lectures and in-class groupwork. We will analyze cases, discuss how to approach real-world problems, dissect published AI articles, and make presentations on AI approaches and solutions. You should be ready to fully participate, discuss your reasoning, work as part of a team, and make short presentations throughout the term.

Assessment Strategy

Assessment will be done in a continuous form, accomplished within the term. There will be a group project that will count for 70% of the final grade; timed quizzes that will count for 10% in total; and an individual coursework that will count for 20%.

Feedback

Feedback will be continuous during the term, with frequent opportunities to present ideas in progress. Intermediary ideas presented will receive formative feedback. Final reports will be supplied with written feedback.

Reading list

Baxter, John SH. "Separable vs. End-to-End Learning: A Critical Examination of Learning

Paradigms." Ethical and Philosophical Issues in Medical Imaging", Held in Conjunction with MICCAI 2022, Singapore, September 18–22, 2022, Proceedings. Cham: Springer Nature Switzerland, 2022.

Bessadok, Alaa, Mohamed Ali Mahjoub, and Islem Rekik. "Graph neural networks in network neuroscience." IEEE Transactions on Pattern Analysis and Machine Intelligence 45.5 (2022): 5833-5848.

Magistretti, S., Bianchi, M., Calabretta, G., Candi, M., Dell'Era, C., Stigliani, I. and Verganti, R., 2022. Framing the multifaceted nature of design thinking in addressing different innovation purposes. Long Range Planning, 55(5), p.102163.

Eagelman, David, and Anthony Brandt. The runaway species: How human creativity remakes the world. Catapult, 2017.

Gilbert, Elizabeth. Big magic: How to live a creative life, and let go of your fear. Bloomsbury Publishing, 2015.

Video: IDEO Shopping Cart

## Quality assurance

Date of first approval

Date of last revision

Date of this approval

Module leader

Notes/ comments

## Office use only

QA Lead

Department staff

Date of collection

Date exported

Date imported

## Assessment details

## Grading method

Numeric

Pass mark

50%

## Assessments

[illegible]

100%