

STUDY GUIDE

AI in architecture and design process

Organised by

Poznan University of Technology

1. IDENTIFYING DATA.	
· Course Name.	AI in architecture and design process
· Coordinating University.	Poznan University of Technology
· Partner Universities Involved.	None for delivery; course open to students from all EUNICE partner universities.
· Course Field(s).	Architecture; Interior Design; Urban Design and Planning; Built Environment; Design Studies; Computational / Digital Design, Innovatics, Bionics and Industrial Design
· Related Study Programme.	EUNICE common elective course. Recommended for programmes in Architecture, Interior Architecture, Urban Planning, Design, Civil Engineering / Built Environment and related creative or technical fields.
· ISCED Code.	ISCED-F 2013: 0731 Architecture and town planning; complementary fields: 0212 Fashion, interior and industrial design; 0613 Software and applications development and analysis.
· SDG.	4 Quality Education; 8 Decent Work and Economic Growth; 9 Industry, Innovation and Infrastructure; 11 Sustainable Cities and Communities; 12 Responsible Consumption and Production.
· Study Level.	B / M / D. Primarily for Bachelor and Master students; Doctoral students may participate when their research relates to architecture, design, AI, education or the built environment.
· EUNICE Key Competencies	Problem solving: Green – strongly Teamworking: Orange – moderately Communication: Green – strongly Self-management: Orange – moderately Cognitive flexibility: Green – strongly Digital competence: Green – strongly Technical competence: Orange – moderately Global intercultural competence: Orange – moderately

· Number of ECTS credits allocated.	4 ECTS credits (approx. 86.25 student workload hours: 33.75 h synchronous online classes + 52.5 h guided self-study, exercises, reading and final project work).
· Mode of Delivery.	Online live, supported by online self-study. The course is designed for synchronous meetings with short asynchronous tasks between classes.
· Language of Instruction.	English. Polish may be used only for individual organisational support if necessary.

· Course Dates.	1.10.2026 – 7.01.2027
· Precise Schedule of the Lectures.	15 weekly online meetings, 135 minutes each. Total synchronous teaching time: 33.75 hours. Each meeting combines a short lecture, live demonstration, guided exercise and discussion / critique.
· Key Words.	artificial intelligence; generative AI; architecture; design process; prompt engineering; human-AI collaboration; computational design; design research; visualisation; ethics; AI literacy; sustainable built environment.
· Catchy Phrase.	“I learned how to use AI not as a shortcut, but as a critical design partner.”

· Prerequisites and co-requisites.	Prerequisites: no advanced programming knowledge required. Basic digital literacy and familiarity with architectural / design thinking are recommended. Available for: B, M and D students, especially from architecture, design, planning, built environment, engineering, arts and related programmes. Required language skills: English B2 recommended, sufficient for discussion, short written assignments and final presentation. Students should have access to a computer, stable internet connection, browser-based AI tools and a visual presentation tool. Free or institutional tools will be prioritised.
· Number of EUNICE students that can attend the Course.	Maximum 30 EUNICE students in total. This size supports online interaction, group critique and feedback on project work. More than one course can be provided in one semester.
· Number of EUNICE students that can attend the course per institution	Suggested minimum reserved places: 3 students per EUNICE institution, subject to the final EUNICE registration procedure and demand. More students if more course hours Will be available.
· Course inscription procedure(s).	Standard EUNICE common course registration procedure. Selection, if necessary, based on eligibility, motivation, disciplinary diversity and balanced representation of partner universities.

2. CONTACT DETAILS.

· Department.	Division of Sustainable Design, Institute of Architecture and Physical Planning, Faculty of Architecture, Poznan University of Technology
· Name of Lecturer.	PhD Eng. Arch. Maciej Bilski
· E-mail.	maciej.bilski@put.poznan.pl

<p>· Other Lecturers.</p>	<p>Guest lecturers or invited critics may be added depending on availability, for example specialists in computational design, AI ethics, architectural visualisation, urban analysis or professional practice.</p>
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3. COURSE CONTENT.

The course introduces students to the responsible and creative use of artificial intelligence in architecture and the design process. It combines lectures, live demonstrations, guided exercises and project-based work. Students learn how generative AI and analytical AI tools can support research, site and context analysis, concept generation, design narratives, visual exploration, user-centred scenarios, critique, presentation and reflection. The course emphasises AI literacy, prompt engineering, critical evaluation of outputs, ethics, authorship, copyright, data privacy, bias, sustainability and the changing role of the architect and designer. The final outcome is a small individual or group project documenting a transparent human-AI design workflow rather than only a polished visual result.

4. LEARNING OUTCOMES.

Knowledge: explain basic concepts of AI, generative AI, machine learning, large language models and image-generation models in relation to architecture and design.

Knowledge: identify opportunities and limitations of AI tools at different stages of the architectural design process.

Skills: formulate structured prompts and iterative prompting strategies for text, image, analysis and design-support tasks.

Skills: use AI tools to support research, concept development, visual exploration, critique and communication of an architectural or design idea.

Skills: critically evaluate AI-generated outputs in terms of accuracy, relevance, spatial quality, originality, bias, ethics and sustainability.

Skills: document and present a transparent human-AI workflow, including input data, prompts, iterations, decisions and authorship declaration.

Competence: collaborate in an international online environment and give constructive feedback on design processes using AI.

Competence: apply responsible AI principles, including data protection, copyright awareness, fairness, accessibility and human oversight.

5. OBJECTIVES.

Develop practical AI literacy for architecture and design students across EUNICE universities. Show how AI can support, but not replace, architectural judgement, spatial thinking and responsibility.

Train students to use prompt engineering as a design, research and communication method.

Connect AI-supported workflows with human-centred, sustainable and ethical design practice. Encourage critical reflection on authorship, originality, bias, copyright, privacy and professional accountability.

Prepare students to build a small design-research portfolio demonstrating a transparent AI-assisted design process.

6. COURSE ORGANISATION.

UNITS

1. AI literacy for architects and designers: concepts, tools, opportunities, limitations and responsible use.
2. Prompting, research and analysis: LLMs, structured prompts, site/context analysis, personas, scenarios and design narratives.
3. Generative design exploration: text-to-image, image-to-image, moodboards, spatial atmosphere, visual critique, multimodal workflows and documentation.
4. Human-AI design project: ethical workflow, iteration, evaluation, presentation, peer critique and final reflection.

LEARNING RESOURCES AND TOOLS.

Examples of tool categories: LLM chat assistants; text-to-image and image-to-image tools; AI-supported research and summarisation tools; collaborative whiteboards; slide / portfolio tools.

The course is tool-agnostic: students may use different tools as long as they document the workflow, respect copyright and privacy, and critically assess results.

PLANNED LEARNING ACTIVITIES AND TEACHING METHODS.

Teaching methods: problem-based learning, design studio methods, flipped micro-tasks, critique-based learning, collaborative analysis, case studies, demonstration and reflective practice.

Learning activities are planned for international online participation and do not require specialist laboratory access.

Detailed 15-week online schedule

Each weekly meeting lasts 135 minutes and includes: 30 minutes lecture input, 60 minutes live demonstration or guided exercise, and 45 minutes discussion and consultations, critique or project work. The schedule can be adapted to the EUNICE academic calendar.

Week	Topic	Main focus	In-class / between-class activity
1	Course introduction: AI in architecture and design process	AI literacy; course rules; examples of AI-supported design workflows.	Diagnostic prompt exercise; define personal learning goals.
2	How generative AI works and where it fails	LLMs, diffusion models, multimodality, hallucinations, bias and uncertainty.	Analyse AI outputs and identify risks in architectural use.
3	Prompt engineering for architecture and design	Roles, context, constraints, output formats, iteration and critique prompts.	Build a reusable prompt template for a design task.
4	AI-supported research and precedent analysis	Research questions, literature mapping, source verification and responsible summarisation.	Create a verified precedent / context research brief.

5	Site, context and user analysis with AI	Spatial context, stakeholders, personas, scenarios and design problems.	Develop personas and use scenarios for a selected design challenge.
6	From brief to concept: AI as design sparring partner	Concept generation, alternatives, evaluation criteria and design narrative.	Generate and compare three concept directions.
7	Text-to-image and visual ideation	Mood, atmosphere, materiality, composition, visual references and limitations.	Create a visual concept board with prompt documentation.
8	Image iteration and multimodal workflows	Image-to-image, sketch-to-image, critique loops and maintaining design intention.	Iterate one concept through visual and textual feedback.
9	AI, diagrams and communication	Narrative diagrams, explanatory text, captions, presentation structure and audience adaptation.	Prepare a diagram/storyboard for the developing project.
10	Human-centred and inclusive AI-supported design	Accessibility, emotional response, behavioural scenarios and participatory perspectives.	Test the concept from different user perspectives.
11	Ethics, copyright, authorship and EU regulatory context	AI Act basics, data privacy, copyright, disclosure, bias and accountability.	Prepare an AI-use and authorship declaration for the project.
12	Sustainability and responsible material / energy thinking	AI for early-stage sustainability questions, circularity, limitations of generic answers.	Use AI to generate sustainability criteria and verify assumptions.
13	Project clinic: workflow integration	Individual/group consultations, peer critique and gap analysis.	Refine final workflow, evidence and presentation structure.
14	Final presentations: human-AI design workflow	Student presentations with peer and lecturer feedback.	Present project, process log and critical evaluation.
15	Reflection, future practice and course wrap-up	Professional implications, AI literacy after the course, portfolio and lifelong learning.	Submit final reflective report and discuss lessons learned.

7. ASSESSMENT METHODS, CRITERIA AND PERIOD.

The course is graded. Assessment is continuous and project-based; there is no written exam. Assessment period: formative feedback during weeks 4, 8 and 13; final presentation in week 14; final submission after week 15, according to the EUNICE deadline.

Components:

1. Participation and short weekly exercises – 20%. Criteria: attendance, preparedness, active participation, constructive peer feedback and completion of micro-tasks.
2. AI workflow logbook / prompt portfolio – 25%. Criteria: clarity of prompts, iteration quality, documentation of decisions, source checking and critical reflection on errors or limitations.
3. Mid-semester concept package – 20%. Criteria: design problem definition, research quality, concept alternatives, relevance of AI use and critical selection of outputs.
4. Final project presentation and reflective report – 35%. Criteria: coherent human-AI design process, architectural/design quality, ethical and legal awareness, sustainability reflection, communication quality and transparent authorship declaration.

Students may work individually or in groups of 2–3. Group submissions must include a short statement of individual contributions.

OBSERVATIONS.

AI use is allowed and expected, but it must be transparent. Students must not submit unverified AI output as factual knowledge.

All projects must include an AI-use declaration listing tools, types of prompts, generated outputs, edited outputs and human decisions.

Students must avoid uploading confidential, personal or copyrighted material unless they have the right to use it.

Accessibility needs should be communicated at the beginning of the course so that online activities and assessment can be adapted where possible.

8. BIBLIOGRAPHY AND TEACHING MATERIALS.

Required / recommended open-access and core materials:

European Parliament and Council of the European Union (2024). Regulation (EU) 2024/1689 laying down harmonised rules on artificial intelligence (Artificial Intelligence Act). Official Journal of the European Union, 12 July 2024. <https://eur-lex.europa.eu/eli/reg/2024/1689/oj>

Miao, F. and Holmes, W. (2023). Guidance for Generative AI in Education and Research. Paris: UNESCO. <https://www.unesco.org/en/articles/guidance-generative-ai-education-and-research>

National Institute of Standards and Technology (2023). Artificial Intelligence Risk Management Framework (AI RMF 1.0). NIST AI 100-1. <https://www.nist.gov/itl/ai-risk-management-framework>

Stanford Institute for Human-Centered Artificial Intelligence (2025). Artificial Intelligence Index Report 2025. Stanford University. <https://hai.stanford.edu/ai-index/2025-ai-index-report>

Rafsanjani, H. N., & Nabizadeh, A. H. (2023). Towards human-centered artificial intelligence (AI) in architecture, engineering, and construction (AEC) industry. *Computers in Human Behavior Reports*, 11, 100319.

DOI: <https://doi.org/10.1016/j.chbr.2023.100319>

Jang, S., Roh, H., & Lee, G. (2025). Generative AI in architectural design: Application, data, and evaluation methods. *Automation in Construction*, 174, 106174.

<https://doi.org/10.1016/j.autcon.2025.106174>

Choudhury, M. M., Eisenbart, B., & Kuys, B. (2025). Artificial intelligence (AI) in the design process – a review and analysis on generative AI perspectives. *Proceedings of the Design Society*, 5, 631–640. <https://doi.org/10.1017/pds.2025.10077>

Aly, A., Elazazy, A., & Sharaf, N. (2025). Integrating Generative AI in Architectural Education: A Comparative Study of Traditional, Stock LLMs, and Custom Tools. In *Proceedings of the 20th International Joint Conference on Computer Vision, Imaging and Computer Graphics Theory and Applications – Volume 1: GRAPP* (pp. 415–420). SciTePress.

<https://doi.org/10.5220/0013378000003912>

Further teaching materials will be provided through the online course platform and will prioritise open-access or institutionally available resources.