CIVIL-475

UE génie civil : Docta Manus

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Cursus	Sem.	Type
Architecture	MA1, MA3	Opt.
Génie civil	MA1, MA3	Obl.

Langue d'enseignement	français
Crédits	4
Retrait	Non autorisé
Session	Hiver
Semestre	Automne
Examen	Pendant le semestre
Charge	120h
Semaines	14
Heures	**4 hebdo**
Cours	2 hebdo
Exercices	2 hebdo
Nombre de places	

It is not allowed to withdraw from this subject after the registration deadline.

Résumé

L'Unité introduira le dessin comme l'outil clé de la communication entre ingénieurs et architectes et comme médiateur entre la construction et l'étudiant. Grâce au dessin, nous analyserons des projets structurels sélectionnés qui incarnent une interaction exemplaire entre l'espace et la structure.

Contenu

Drawing constitutes a very powerful and critical tool of conceptual design. Drawing constructs thought, it acts as a communication interface between the work and the mind and between different disciplines; it is the most powerful language of communication in the working together between architects and engineers.
The UE Docta Manus Structures will introduce the basic drawing techniques (sketch, plan, section, elevation, axonometry, perspective). Based on these techniques, we will further investigate analytical drawing methods capable of exploring structural concepts and their architectural solutions.
Through hand drawing we will analyse selected projects that embody an exemplary interplay of architecture and engineering, as e.g. the work of Mies van der Rohe, Jean Prouvé, Luigi Nervi, Robert Maillard or Eugène Freyssinet. Our main focus lies on the load bearing structure and its tectonic and spatial articulation as common intersection between architecture and engineering. Through analysis, students will enter into dialogue with construction in a direct way. They will get a sense for the adequacy of tools and refinements of solutions. We will investigate proportion, material innovation and tectonic articulation in relation to the structural idea and become aware of the importance of detail. Analysis will take apart and make transparent the parameters and dependencies of the design process and will open the work into a condition of possibility.
We will draw by hand, as this is the most direct and immediate way of becoming aware of technique in relation to intention (it forces to take decisions). Drawing by hand is a cognitive process where the dynamic relation between doing and thinking is essential. That is why ‘the more you draw, the more you see' and vice versa. The construction of points and lines on a sheet of paper will sensitize students to the notions of scale, size, proportion, transparency and composition. The learning hand will build up tacit knowledge.

Mots-clés

Hand drawing, analysis, structures, tectonics, tacit knowledge.

Compétences requises

Concepts importants à maîtriser

- To understand and master the basic drawing techniques: sketch, plan, section, elevation, axonometry, perspective, structural sketch, structural plan.

- To understand the geometric logic of two-dimensional drafting planes and their implications in three-dimensional space;
- To analyse the structural and tectonic logic of a given project by means of an adequate analytical drawing method;
- To understand key structural concepts and their material solutions;
- To develop an understanding of material limits, material innovation and mounting principles;
- To become aware of the enhanced potential of a project designed on the basis of a dialogue between architecture and engineering;
- To develop a coherent argument through drawing.

Acquis de formation

A la fin de ce cours l'étudiant doit être capable de:

- Analyser
- Investiguer
- Construire
- Comparer

Compétences transversales

- Communiquer efficacement et être compris y compris par des personnes de languages et cultures différentes.
- Dialoguer avec des professionnels d'autres disciplines.
- Faire preuve d'inventivité
- Faire preuve d'esprit critique

Méthode d'enseignement

Hand-drawing, lectures, collaborative discussions; interdisciplinary teaching team

Travail attendu

Ongoing evaluation; students will be evaluated on the basis of the following criteria:

- ability to work in drawing as construction;
- capacity to use analysis as a means of advancing an architectural and structural idea;
- collaboration (communication, team work, flexibility within different roles);
- engagement (participation, initiative, responsibility)

Méthode d'évaluation

Ongoing evaluation; students will be evaluated on the basis of the objectives stated in learning outcomes and their engagement (critical thinking, participation, initiative, collaboration).

Ressources

Bibliographie

Berger, J. (2008). *Ways of Seeing.* Penguin UK
Cruz Prieto, Fabio. (1993) *De l'Observation*. Vina del mar: Inéditos
Dethier, J., & Walter, M. (1984). *Images et imaginaires d'architecture: Dessin peinture photographie arts graphiques de théâtre cinéma en Europe aux XIXe et XXe siècles*. Centre Georges Pompidou

Pérez-Gómez, A. & L. Pelletier. (2000). *Architectural representation and the perspective hinge*. Cambridge/London, MIT Press
Rice, Peter. (1994) *An Engineer Imagines*. Artemis.
Spiro, A., & Ganzoni, D. (2013). *The working drawing: The architect's tool*. Park Books
Schön, D. A. (2017). *The reflective practitioner: How professionals think in action*. Routledge

Ressources en bibliothèque

- Rice, Peter. (1994) An Engineer Imagines. Artemis.
- Pérez-Gómez, A. & L. Pelletier. (2000). Architectural representation and the perspective hinge
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Liens Moodle

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