INTERDISCIPLINARY MINOR IN INTEGRATED DESIGN, ARCHITECTURE AND SUSTAINABILITY

Laboratory of Architecture and Sustainable Technologies (LAST)
Laboratory of Integrated Performance in Design (LIPID)
Structural Xploration Lab (SXL)
Building2050 Group

ideas.epfl.ch
ISSUES AND OBJECTIVES

• Integration of energy transition and climate change issues in MA cycle
  - focus on use of natural resources, carbon neutrality and energy consumption (integrated design)
  - valorization of existing course offering

• ENAC synergies
  - interdisciplinarity
  - broad spectrum of ENAC classes (MA level) at the interface between design, technology and society

• Targeted orientation for students
  - resource- and energy efficiency, occupant comfort, climate-responsive strategies to deal with complexity
  - valorize your competences in sustainable architecture and integrated design in the practice
  - research by design
PRINCIPLES AND COURSE OFFERING

• Course offering
  - list of 23 courses totaling 78 ECTS, mostly within ENAC
  - class offerings in the fall, spring and summer
  - courses outside EPFL (max 5 ECTS, validated by IDEAS committee)

• Diversified selection
  - balanced selection from SAR, SGC, SSIE with some classes from STI or SB
  - combination of theory classes on comfort, energy, environment and infrastructure, and of project-based courses
IDEAS MINOR REQUIREMENTS

• Minimum 30 ECTS (to be validated by SAC)

• Equal balance of ECTS from two groups:
  - **Core courses**: Minimum 14 ECTS  
    Basics on energy (GC), comfort (AR), ecological footprint (SIE)  
    and hands-on (semester projects/UE)
  - **Theory courses**: Minimum 14 ECTS  
    3 topics: energy (fundamentals), environment (strategies),  
    systems (infrastructures)

• At least 10 ECTS chosen outside of own section

• Validation by IDEAS Minor Committee

• Interactive **validation form** available on the IDEAS website  
  > ideas.epfl.ch
IDEAS MINOR

The interdisciplinary Minor in Integrated Design, Architecture and Sustainability (IDEAS) responds to a need to further reinforce the integration of sustainability questions within the Master's Cycle in Architecture, Civil and Environmental Engineering. It focuses on issues of energy consumption and the use of natural resources within the global framework of Integrated Design.
## CORE COURSES  (Min. 14 ECTS / Total 32 ECTS)

<table>
<thead>
<tr>
<th>Code</th>
<th>Class</th>
<th>Lecturer(s)</th>
<th>Section</th>
<th>ECTS</th>
</tr>
</thead>
<tbody>
<tr>
<td>ENG-445</td>
<td>Building energetics</td>
<td>Khovalyg/Licina</td>
<td>GC</td>
<td>3</td>
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<tr>
<td>ENV-461</td>
<td>Sustainability assessment of urban systems</td>
<td>Binder/Merino-Saum + Merino-Saum</td>
<td>SIE</td>
<td>3</td>
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<tr>
<td>AR-442</td>
<td>Comfort and architecture: sustainable strategies</td>
<td>Andersen/Karmann/Wienold + Karmann/Wienold</td>
<td>AR</td>
<td>3</td>
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<tr>
<td>AR-434</td>
<td>Théories et techniques du projet de sauvegarde</td>
<td>Graf/Marino</td>
<td>AR</td>
<td>3</td>
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<tr>
<td>PENS-494</td>
<td>Projet ENAC pour mineur IDEAS*</td>
<td>Divers enseignants</td>
<td>AR/GC/SIE</td>
<td>4</td>
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<tr>
<td>CIVIL-493</td>
<td>Projet interdisciplinaire à option*</td>
<td>Profs divers</td>
<td>GC</td>
<td>4</td>
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<tr>
<td>PENS-491</td>
<td>Summer workshop**</td>
<td>Divers enseignants</td>
<td>AR/GC/SIE</td>
<td>4</td>
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<tr>
<td>AR-440</td>
<td>UE K : Architecture et durabilité: études de performances</td>
<td>Andersen/Fivet/ Rey/Karmann/Fumeaux/Pastore</td>
<td>AR</td>
<td>4</td>
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<tr>
<td>AR-435</td>
<td>UE R : Introduction au BIM</td>
<td>Cache/Hautecoeur</td>
<td>AR</td>
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### Theory Courses

*(Min. 14 ECTS / Total 51 ECTS)*

<table>
<thead>
<tr>
<th>Code</th>
<th>Class</th>
<th>Lecturer(s)</th>
<th>Section</th>
<th>ECTS</th>
</tr>
</thead>
<tbody>
<tr>
<td>AR-449</td>
<td>Architecture et énergie solaire</td>
<td>Munari Probst</td>
<td>AR</td>
<td>3</td>
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<tr>
<td>ME-454</td>
<td>Modelling and optimization of energy systems</td>
<td>Maréchal</td>
<td>GM</td>
<td>4</td>
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<tr>
<td>ENV-409</td>
<td>Air pollution</td>
<td>Takahama/Reimann</td>
<td>SIE</td>
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<tr>
<td>ENG-474</td>
<td>Etudes d’impact</td>
<td>Schmidt F./Devanthéry/Helfer</td>
<td>GC</td>
<td>3</td>
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<tr>
<td>MSE-463</td>
<td>Recycling of materials</td>
<td>Leterrier</td>
<td>MX</td>
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<tr>
<td>ENV-469</td>
<td>Systèmes de management environnementaux</td>
<td>Baracchini</td>
<td>SIE</td>
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<tr>
<td>CIVIL-450</td>
<td>Thermodynamics of comfort in buildings</td>
<td>Khovalyg</td>
<td>GC</td>
<td>3</td>
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<tr>
<td>CIVIL-460</td>
<td>Indoor air quality and ventilation</td>
<td>Licina</td>
<td>GC</td>
<td>3</td>
</tr>
<tr>
<td>AR-496</td>
<td>Behind/Beyond future cities</td>
<td>Mauree/Coccolo</td>
<td>AR</td>
<td>3</td>
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<tr>
<td>AR-497</td>
<td>Building design in the circular economy</td>
<td>Fivet</td>
<td>AR</td>
<td>3</td>
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<tr>
<td>ENV-470</td>
<td>Development engineering</td>
<td>Hostettler/Schönenberger</td>
<td>SIE</td>
<td>4</td>
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<tr>
<td>AR-483</td>
<td>Interactive conceptual design of structural forms</td>
<td>Fivet</td>
<td>AR</td>
<td>3</td>
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<tr>
<td>ENV-501</td>
<td>Material and energy flow analysis</td>
<td>Moreau/Binder/Athanassiadis</td>
<td>SIE</td>
<td>4</td>
</tr>
<tr>
<td>AR-484</td>
<td>Introduction au BIM</td>
<td>Hautecoeur</td>
<td>AR</td>
<td>3</td>
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</tbody>
</table>

Course outside EPFL (upon request, in agreement with IDEAS committee) Various prof. 5 max.

Global ECTS offer 106

(Autumn: 17 courses | Spring: 16 courses)

Total min 30 ECTS

* Provided that the topic is relevant, to be validated with the IDEAS Minor steering committee.

**Course during 4 weeks in the summer.
IDEAS MINOR STUDENTS

- 92 students in total (August 2022)
  - 70 IDEAS Minors achieved
    (30 Architecture, 26 Civil Eng., 14 Environmental Eng.)
  - 22 IDEAS Minors in progress
    (16 Architecture, 5 Civil Eng., 1 Environmental Eng.)

• Valorization opportunities for IDEAS Minor Alumni in the fields of professional practice, innovative start-ups and research

• Increased demand for skills in integrated design, architecture and sustainability
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