

# Studies Plan

## Systèmes urbains 2025-2026

### Block 1 "Core foundations"

| Courses  |           |       | Master 1                   |                |   | Master 2 |    |    | Exam Session |     | Exam | Credit                |                       |   |
|--|-----------|-------|----------------------------|----------------|---|----------|----|----|--------------|-----|------|-----------------------|-----------------------|---|
| Lang.  | Code      | Sect. | Teacher                    | Specialization | 2 | T        | P  | I  | C            | E   | L    | T                     | P                     | I |
| <b>Computational systems thinking for sustainable eng.</b> |           |       |                            |                |   |          |    |    |              |     |      |                       |                       |   |
| E  | CIVIL-534 | GC    | Sonta                      |                |   | 2h       | 1h |    | 1h           |     | Sum  |                       | During the 4 semester |   |
| <b>Social justice and transition in the urban context</b>  |           |       |                            |                |   |          |    |    |              |     |      |                       |                       |   |
| E  | URB-403   | SIE   | Pattaroni                  |                |   | 2h       | 1h |    |              |     | Sum  | Oral                  | 3                     |   |
| <b>Systems approaches for urban transitions</b>            |           |       |                            |                |   |          |    |    |              |     |      |                       |                       |   |
| E  | URB-401   | SIE   | Binder<br>Hecher<br>Jessel |                |   | 2h       | 2h |    |              |     | Win  | Oral                  | 4                     |   |
| <b>Urban digital twins</b>                                 |           |       |                            |                |   |          |    |    |              |     |      |                       |                       |   |
| E  | URB-410   | SIE   | Kaplan                     |                |   | 3h       |    | 1h |              | Sum |      | During the 4 semester |                       |   |
| <b>Urban governance</b>                                    |           |       |                            |                |   |          |    |    |              |     |      |                       |                       |   |
| E  | URB-402   | SIE   | Genoud                     |                |   | 2h       | 2h |    |              | Sum |      | Written               | 4                     |   |

### Block 2 "Practical"

| Courses                                  |         |       | Master 1     |                |   | Master 2 |   |   | Exam Session |     | Exam | Credit                 |   |   |
|--|---------|-------|--------------|----------------|---|----------|---|---|--------------|-----|------|------------------------|---|---|
| Lang.                                    | Code    | Sect. | Teacher      | Specialization | 2 | T        | P | I | C            | E   | L    | T                      | P | I |
| <b>Projet core</b>                       |         |       |              |                |   |          |   |   |              |     |      |                        |   |   |
| F  | URB-420 | SIE   | Profs divers |                |   | 2h       |   |   | 8h           | Sum |      | During the 10 semester |   |   |
| <b>Projet spécialisation</b>             |         |       |              |                |   |          |   |   |              |     |      |                        |   |   |
| F  | URB-425 | SIE   | Profs divers |                |   | 10h      |   |   | 10h          | Sum | Win  | During the 10 semester |   |   |
| <b>HSS : Introduction to project SHS</b> |         |       |              |                |   |          |   |   |              |     |      |                        |   |   |
| <b>HSS : Project SHS</b>                 |         |       |              |                |   |          |   |   |              |     |      |                        |   |   |

### Group 1 "Core options"

| Courses   |           |       | Master 1   |                |    | Master 2 |    |    | Exam Session |     | Exam | Credit                |   |   |
|---|-----------|-------|------------|----------------|----|----------|----|----|--------------|-----|------|-----------------------|---|---|
| Lang.   | Code      | Sect. | Teacher    | Specialization | 2  | T        | P  | I  | C            | E   | L    | T                     | P | I |
| <b>Climate and water sensitive urban design</b>             |           |       |            |                |    |          |    |    |              |     |      |                       |   |   |
| E   | ENV-526   | SIE   | Manoli     |                |    | 2h       |    | 2h |              | Sum |      | During the 4 semester |   |   |
| <b>Computational methods in urban studies</b>               |           |       |            |                |    |          |    |    |              |     |      |                       |   |   |
| E   | URB-404   | SIE   | Gumy Rames |                | 2h | 1h       |    |    |              | Win |      | During the 3 semester |   |   |
| <b>Ecological contributions to cities in transformation</b> |           |       |            |                |    |          |    |    |              |     |      |                       |   |   |
| E   | URB-405   | SIE   |            |                | 2h | 1h       |    |    |              | Win |      | During the 3 semester |   |   |
| <b>Innovation for construction and the environment</b>      |           |       |            |                |    |          |    |    |              |     |      |                       |   |   |
| E   | CIVIL-424 | GC    | Terzis     |                | 2h | 1h       |    |    |              | Win |      | During the 3 semester |   |   |
| <b>Introduction to transportation systems</b>               |           |       |            |                |    |          |    |    |              |     |      |                       |   |   |
| E   | CIVIL-355 | GC    | Bierlaire  |                |    | 2h       | 1h |    |              | Sum |      | During the 3 semester |   |   |
| <b>Railway systems and their transition</b>                 |           |       |            |                |    |          |    |    |              |     |      |                       |   |   |
| E   | URB-406   | SIE   | Kummer     |                | 2h | 1h       |    |    |              | Win | Oral | 3                     |   |   |

|   |   |         |     |                             |    |    |     |                       |         |         |   |
|---|---|---------|-----|-----------------------------|----|----|-----|-----------------------|---------|---------|---|
| <b>Science and technology in urban transformation</b>     | E | URB-407 | SIE | Baudry<br>Graezer<br>Bideau | 1h | 2h | Sum | During the 3 semester | 3       |         |   |
| <b>Science of climate change</b>                          | E | ENV-410 | SIE | Schmale                     | 2h | 2h | 1h  | Win                   | Written | 4       |   |
| <b>Sensing and spatial modeling for earth observation</b> | E | ENV-408 | SIE | Berne<br>Skaloud<br>Tuia    |    | 2h | 2h  | 1h                    | Sum     | Written | 5 |

**Group 2 "Specialization"**

| Courses  |           |       |                                    | Master 1       |    | Master 2 |    | Exam Session | Exam | Credit |     |                       |                       |   |
|--|-----------|-------|------------------------------------|----------------|----|----------|----|--------------|------|--------|-----|-----------------------|-----------------------|---|
| Lang.  | Code      | Sect. | Teacher                            | Specialization | L  | T        | P  | I            | C    | E      | L   | T                     | P                     | I |
| <b>AI for urban history</b>                              |           |       |                                    |                |    |          |    |              |      |        |     |                       |                       |   |
| E  | URB-409   | SIE   | Di Lenardo                         |                |    | 3h       | 1h |              |      |        | Sum |                       | During the 4 semester | 4 |
| <b>Air pollution</b>                                     |           |       |                                    |                |    |          |    |              |      |        |     |                       |                       |   |
| E  | ENV-409   | SIE   | Reimann<br>Bhend<br>Takahama       |                |    | 2h       |    | 3h           |      | Sum    |     | Written               | 5                     |   |
| <b>Behind/Beyond future cities</b>                       |           |       |                                    |                |    |          |    |              |      |        |     |                       |                       |   |
| E  | AR-496    | AR    | Coccolo<br>Mauree                  |                |    | 2h       |    |              |      | Sum    |     | Oral                  | 3                     |   |
| <b>Building design in the circular economy</b>           |           |       |                                    |                |    |          |    |              |      |        |     |                       |                       |   |
| E  | AR-497    | AR    | Fivet<br>Küpfer                    |                | 2h |          |    |              |      | Win    |     | Oral                  | 3                     |   |
| <b>City and mobility</b>                                 |           |       |                                    |                |    |          |    |              |      |        |     |                       |                       |   |
| F  | AR-458    | AR    | Drevon<br>Kaufmann                 |                |    | 2h       |    |              |      | Sum    |     | Written               | 3                     |   |
| <b>Comfort and architecture: sustainable strategies</b>  |           |       |                                    |                |    |          |    |              |      |        |     |                       |                       |   |
| E  | AR-442    | AR    | Pastore<br>Wienold                 |                | 2h | 1h       |    |              |      | Win    |     | Oral                  | 3                     |   |
| <b>Decision-aid methodologies in transportation</b>      |           |       |                                    |                |    |          |    |              |      |        |     |                       |                       |   |
| E  | CIVIL-557 | GC    | Bierlaire<br>Paschalidis<br>Torres |                |    | 2h       | 2h |              |      | Sum    |     | During the 4 semester | 4                     |   |
| <b>Design and construction of roadways</b>               |           |       |                                    |                |    |          |    |              |      |        |     |                       |                       |   |
| F  | CIVIL-463 | GC    | Tille                              |                | 2h | 1h       |    |              |      | Win    |     | Written               | 3                     |   |
| <b>Digital epidemiology</b>                              |           |       |                                    |                |    |          |    |              |      |        |     |                       |                       |   |
| E  | BIO-512   | SV    | Salathé                            |                |    | 2h       | 2h |              |      | Sum    |     | During the 4 semester | 4                     |   |
| <b>Energy supply, economics and transition</b>           |           |       |                                    |                |    |          |    |              |      |        |     |                       |                       |   |
| E  | ENG-410   | SIE   | Ballif<br>Binder<br>Thalmann       |                |    | 2h       |    |              |      | Sum    |     | Written               | 2                     |   |
| <b>Exploratory data analysis in environmental health</b> |           |       |                                    |                |    |          |    |              |      |        |     |                       |                       |   |
| E  | ENV-444   | SIE   | Joost<br>Nehme                     |                | 2h | 2h       |    |              |      | Win    |     | During the 4 semester | 4                     |   |
| <b>Fundamentals of traffic operations and control</b>    |           |       |                                    |                |    |          |    |              |      |        |     |                       |                       |   |
| E  | CIVIL-457 | GC    | Geroliminis                        |                | 2h | 1h       | 1h |              |      | Win    |     | During the 4 semester | 4                     |   |
| <b>Green spaces - Concepts and planning approaches</b>   |           |       |                                    |                |    |          |    |              |      |        |     |                       |                       |   |
| E  | AR-532    | AR    | Jessel                             |                |    | 1h       | 2h |              |      | Sum    |     | During the 4 semester | 4                     |   |
| <b>Groundwater and soil remediation</b>                  |           |       |                                    |                |    |          |    |              |      |        |     |                       |                       |   |
| E  | ENV-504   | SIE   | Bernier-Latman                     |                | 2h | 2h       |    |              |      | Win    |     | Oral                  | 4                     |   |
| <b>Image processing for Earth observation</b>            |           |       |                                    |                |    |          |    |              |      |        |     |                       |                       |   |
| E  | ENV-540   | SIE   | Tuia                               |                | 2h | 1h       | 1h |              |      | Win    |     | During the 4 semester | 4                     |   |
| <b>Indoor air quality and</b>                            |           |       |                                    |                |    |          |    |              |      |        |     |                       |                       |   |

|   |                                 |     |   |       |     |                                     |
|---|---------------------------------|-----|---|-------|-----|-------------------------------------|
| E   | <b>ventilation</b><br>CIVIL-460 | GC  | Licina                                      | 2h 2h | Sum | <i>During the 4 semester</i>        |
| <b>Material flow analysis and resource management</b>         |                                 |     |   |       |     |                                     |
| E   | ENV-501                         | SIE | Binder<br>Felix<br>Martin<br>Del<br>Campo   | 2h 1h | 1h  | Win<br>Written 4                    |
| <b>Mobility engineering</b>                                   |                                 |     |   |       |     |                                     |
| F   | CIVIL-451                       | GC  | Tufo  | 2h 1h | Win | <i>During the 3 semester</i>        |
| <b>Occupational and environmental health</b>                  |                                 |     |   |       |     |                                     |
| E   | ENV-468                         | SIE | Vernez                                      | 2h 1h | Win | Oral 3                              |
| <b>Planetary health</b>                                       |                                 |     |   |       |     |                                     |
| E   | BIO-413                         | SV  | Banwell<br>D'Angelo<br>McKinney<br>Oricchio | 2h 2h | Win | <i>During the 4 semester</i>        |
| <b>Shaping future railway systems</b>                         |                                 |     |   |       |     |                                     |
| E   | URB-408                         | SIE | Kummer                                      | 2h 1h | Sum | Oral 3                              |
| <b>Spatial and Regional Economy</b>                           |                                 |     |   |       |     |                                     |
| F   | AR-492                          | AR  | Dessemontet                                 | 2h    | Sum | Written 3                           |
| <b>Sustainability assessment of urban systems</b>             |                                 |     |   |       |     |                                     |
| E   | ENV-461                         | SIE | Binder                                      | 2h    | 1h  | Sum<br>Written 3                    |
| <b>Technology, sustainability and public policy</b>           |                                 |     |   |       |     |                                     |
| E   | MGT-450                         | MTE | Aklin                                       | 2h 2h | Win | Written 4                           |
| <b>Transportation economics</b>                               |                                 |     |   |       |     |                                     |
| E   | CIVIL-455                       | GC  | Geroliminis<br>Yang<br>de<br>Palma          | 2h 1h | Sum | <i>During the 3 semester</i>        |
| <b>UE J : Territory and landscape</b>                         |                                 |     |   |       |     |                                     |
|   | AR-471                          | AR  | Cogato<br>Lanza<br>Riondel                  | 3h 1h | Win | <i>During the 4 semester</i>        |
| <b>Urban and territorial analysis</b>                         |                                 |     |   |       |     |                                     |
| F   | AR-264                          | AR  | Cogato<br>Lanza<br>Riondel                  | 1h 2h | Sum | <i>During the 4 semester</i>        |
| <b>Urban demography</b>                                       |                                 |     |   |       |     |                                     |
| E   | AR-507                          | AR  | Lerch                                       | 2h    | Sum | <i>During the 3 semester</i>        |
| <b>Urban Green&amp;Blue infrastructure and global warming</b> |                                 |     |   |       |     |                                     |
| E   | ENV-462                         | SIE | Kazemi                                      | 2h    | 1h  | Sum<br><i>During the 3 semester</i> |
| <b>Urban habitat and developement</b>                         |                                 |     |   |       |     |                                     |
| F   | AR-465                          | AR  | Felder<br>Pattaroni<br>Schaeben             | 2h    | Sum | Oral 3                              |
| <b>Urban hydraulic systems</b>                                |                                 |     |   |       |     |                                     |
| E   | CIVIL-413                       | GC  | Pfister                                     | 2h 1h | Sum | Oral 3                              |
| <b>Urbanism and Territories</b>                               |                                 |     |   |       |     |                                     |
| F   | AR-455                          | AR  | Kaufmann<br>Viot                            | 2h    | Win | <i>During the 3 semester</i>        |
| <b>Urban public transport systems</b>                         |                                 |     |   |       |     |                                     |
| E   | CIVIL-324                       | GC  | Zhang                                       | 2h 1h | Sum | <i>During the 3 semester</i>        |
| <b>Urban sociology</b>  |                                 |     |   |       |     |                                     |
| F   | AR-489                          | AR  | Del<br>Puppo<br>Felder<br>Pattaroni         | 2h    | Win | <i>During the 3 semester</i>        |

## Master project

| Courses |         |       | Master 1  |                |      | Master 2 |      |   | Exam Session | Exam | Credit |                       |   |   |   |
|---------|---------|-------|---|----------------|------|----------|------|---|--------------|------|--------|-----------------------|---|---|---|
| Lang.   | Code    | Sect. | Teacher   | Specialization | ECTS | L        | T    | P | I            | C    | E      | L                     | T | P | I |
| F       | URB-596 | SIE   | Stage d'ingénierie crédité avec le PDM (master en Systèmes urbains) | Profs divers   |      |          | 320h |   |              | 320  | Win    | During the 0 semester | 0 |   |   |