

**MASTER CHEMICAL ENGINEERING**  
Semestre 1

| Teaching Unit                                                                                      | Subjects                                                                | Credits   | Coefficient | Weekly hourly volume |             |             | Hourly Volume Semestriel (15 weeks) | Additional work in Consultation (15 weeks) | Evaluation Mode       |      |
|----------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------|-----------|-------------|----------------------|-------------|-------------|-------------------------------------|--------------------------------------------|-----------------------|------|
|                                                                                                    | Titled                                                                  |           |             | Course               | TUT         | PW          |                                     |                                            | Continuous Assessment | Exam |
| <b>Fundamental TU</b><br><b>Code : FTU 1.1.1</b><br><b>Credits : 10</b><br><b>Coefficients : 5</b> | Unit Operations I<br><i>(distillation, Extraction sol-liq mixtures)</i> | 6         | 3           | 3h00                 | 1h30        |             | 67h30                               | 82H30                                      | 40%                   | 60%  |
|                                                                                                    | Dispersion in Porous Media                                              | 4         | 2           | 1h30                 | 1h30        |             | 45h00                               | 55h00                                      | 40%                   | 60%  |
| <b>Fundamental TU</b><br><b>Code : FTU 1.1.2</b><br><b>Credit : 8</b><br><b>Coefficients : 4</b>   | Applied Thermodynamics                                                  | 4         | 2           | 1h30                 | 1h30        |             | 45h00                               | 55h00                                      | 40%                   | 60%  |
|                                                                                                    | Heat Exchanger                                                          | 4         | 2           | 1h30                 | 1h30        |             | 45h00                               | 55h00                                      | 40%                   | 60%  |
| <b>Methodological TU</b><br><b>Code : MTU 1.1</b><br><b>Credits : 9</b><br><b>Coefficients : 5</b> | PW Unit Operations I                                                    | 2         | 1           |                      |             | 1h30        | 22h30                               | 27h30                                      | 100%                  |      |
|                                                                                                    | PW Dispersion in Porous Media                                           | 2         | 1           |                      |             | 1h30        | 22h30                               | 27h30                                      | 100%                  |      |
|                                                                                                    | PW Heat Exchanger                                                       | 2         | 1           |                      |             | 1h30        | 22h30                               | 27h30                                      | 100%                  |      |
|                                                                                                    | Experimental Plans                                                      | 3         | 2           | 1h30                 |             | 1h00        | 37h30                               | 37h30                                      | 40%                   | 60%  |
| <b>Discovery TU</b><br><b>Code : DTU 1.1</b><br><b>Credits : 2</b><br><b>Coefficients : 2</b>      | Green Chemistry – Clean Processes                                       | 1         | 1           | 1h30                 |             |             | 22h30                               | 2h30                                       |                       | 100% |
|                                                                                                    | Physico-Chemical Analysis Methods                                       | 1         | 1           | 1h30                 |             |             | 22h30                               | 2h30                                       |                       | 100% |
| <b>Transversal TU</b><br><b>Code : TTU 1.1</b><br><b>Credit : 1</b><br><b>Coefficients : 1</b>     | Technical English and Terminology                                       | 1         | 1           | 1h30                 |             |             | 22h30                               | 2h30                                       |                       | 100% |
| <b>Total 1<sup>st</sup> semester</b>                                                               |                                                                         | <b>30</b> | <b>17</b>   | <b>13h30</b>         | <b>6h00</b> | <b>5h30</b> | <b>375h00</b>                       | <b>375h00</b>                              |                       |      |

## Semester 2

| Teaching Unit                                                                                      | Subjects                                                                    | Credits   | Coefficient | Weekly hourly volume |              |             | Hourly Volume Semestriel (15 weeks) | Additional work in Consultation (15 weeks) | Evaluation Mode       |      |
|----------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------|-----------|-------------|----------------------|--------------|-------------|-------------------------------------|--------------------------------------------|-----------------------|------|
|                                                                                                    | Titled                                                                      |           |             | Course               | TUT          | PW          |                                     |                                            | Continuous Assessment | Exam |
| <b>Fundamental TU</b><br><b>Code : FTU 1.2.1</b><br><b>Credits : 10</b><br><b>Coefficients : 5</b> | Unit Operations 2<br>(Humidification- Drying- Evaporation- Crystallization) | 6         | 3           | 3h00                 | 1h30         |             | 67h30                               | 82H30                                      | 40%                   | 60%  |
|                                                                                                    | Membrane Adsorption and Separation Process                                  | 4         | 2           | 1h30                 | 1h30         |             | 45h00                               | 55h00                                      | 40%                   | 60%  |
| <b>Fundamental TU</b><br><b>Code : FTU 1.2.2</b><br><b>Credit : 8</b><br><b>Coefficients : 4</b>   | Chemical reaction Engineering 1: non ideal reactors and bioreactors         | 4         | 2           | 1h30                 | 1h30         |             | 45h00                               | 55h00                                      | 40%                   | 60%  |
|                                                                                                    | Boilers and Furnaces                                                        | 4         | 2           | 1h30                 | 1h30         |             | 45h00                               | 55h00                                      | 40%                   | 60%  |
| <b>Methodological TU</b><br><b>Code : MTU 1.2</b><br><b>Credits : 9</b><br><b>Coefficients : 5</b> | PW Unit Operations 2, Membrane Adsorption and Separation Process            | 1         | 1           |                      |              | 1h          | 22h30                               | 27h30                                      | 100%                  |      |
|                                                                                                    | Control and Regulation Processes                                            | 4         | 2           | 1h30                 | 1h30         |             | 37h30                               | 37h30                                      | 40%                   | 60%  |
|                                                                                                    | Numerical Analysis                                                          | 4         | 2           | 1h30                 | 1h30         |             | 45h00                               | 55h00                                      | 40%                   | 60%  |
| <b>Discovery TU</b><br><b>Code : DTU 1.2</b><br><b>Credits : 2</b><br><b>Coefficients : 2</b>      | Subject of choice                                                           | 1         | 1           | 1h30                 |              |             | 22h30                               | 2h30                                       |                       | 100% |
|                                                                                                    | Subject of choice                                                           | 1         | 1           | 1h30                 |              |             | 22h30                               | 2h30                                       |                       | 100% |
| <b>Transversal TU</b><br><b>Code : TTU 1.2</b><br><b>Credit : 1</b><br><b>Coefficients : 1</b>     | Compliance with Standards and Rules of Ethics and integrity                 | 1         | 1           | 1h30                 |              |             | 22h30                               | 2h30                                       |                       | 100% |
| <b>Total 2<sup>nd</sup> semester</b>                                                               |                                                                             | <b>30</b> | <b>17</b>   | <b>15h00</b>         | <b>09h00</b> | <b>1h00</b> | <b>375h00</b>                       | <b>375h00</b>                              |                       |      |

### Semester 3

| Teaching Unit                                                                                      | Subjects                                      | Credits   | Coefficient | Weekly hourly volume |              |             | Hourly Volume Semestriel (15 weeks) | Additional work in Consultation (15 weeks) | Evaluation Mode       |      |
|----------------------------------------------------------------------------------------------------|-----------------------------------------------|-----------|-------------|----------------------|--------------|-------------|-------------------------------------|--------------------------------------------|-----------------------|------|
|                                                                                                    | Titled                                        |           |             | Course               | TUT          | PW          |                                     |                                            | Continuous Assessment | Exam |
| <b>Fundamental TU</b><br><b>Code : FTU 2.1.1</b><br><b>Credits : 10</b><br><b>Coefficients : 5</b> | Foundation of modeling in Process Engineering | 4         | 2           | 1h30                 | 1h30         |             | 45h00                               | 55h00                                      | 40%                   | 60%  |
|                                                                                                    | Refining and Petrochemicals Process           | 4         | 2           | 1h30                 | 1h30         |             | 45h00                               | 55h00                                      | 40%                   | 60%  |
|                                                                                                    | Multiphase Reactors                           | 4         | 2           | 1h30                 | 1h30         |             | 45h00                               | 55h00                                      | 40%                   | 60%  |
| <b>Fundamental TU</b><br><b>Code : FTU 2.1.2</b><br><b>Credit : 8</b><br><b>Coefficients : 4</b>   | Optimization Methods in Process Engineering   | 4         | 2           | 1h30                 | 1h30         |             | 45h00                               | 55h00                                      | 40%                   | 60%  |
|                                                                                                    | Process intensification                       | 2         | 1           | 1h30                 |              |             | 22h30                               | 27h30                                      |                       | 100% |
| <b>Methodological TU</b><br><b>Code : MTU 2.1</b><br><b>Credits : 9</b><br><b>Coefficients : 5</b> | PW Modeling                                   | 2         | 1           |                      |              | 1h30        | 22h30                               | 27h30                                      | 100%                  |      |
|                                                                                                    | PW Refining and Petrochemicals                | 2         | 1           |                      |              | 1h30        | 22h30                               | 27h30                                      | 100%                  |      |
|                                                                                                    | PW Chemical Reaction Engineering              | 2         | 1           |                      |              | 1h30        | 22h30                               | 27h30                                      | 100%                  |      |
|                                                                                                    | Simulators in Process engineering             | 3         | 2           | 1h30                 |              | 1h00        | 37h30                               | 37h30                                      | 40%                   | 60%  |
| <b>Discovery TU</b><br><b>Code : DTU 2.1</b><br><b>Credits : 2</b><br><b>Coefficients : 2</b>      | Subject of choice                             | 1         | 1           | 1h30                 |              |             | 2h30                                | 2h30                                       |                       | 100% |
|                                                                                                    | Subject of choice                             | 1         | 1           | 1h30                 |              |             | 2h30                                | 2h30                                       |                       | 100% |
| <b>Transversal TU</b><br><b>Code : TTU 2.1</b><br><b>Credit : 1</b><br><b>Coefficients : 1</b>     | Documentary research and thesis design        | 1         | 1           | 1h30                 |              |             | 2h30                                | 2h30                                       |                       | 100% |
| <b>Total 3<sup>nd</sup> semester</b>                                                               |                                               | <b>30</b> | <b>17</b>   | <b>13h30</b>         | <b>06h00</b> | <b>5h30</b> | <b>375h00</b>                       | <b>375h00</b>                              |                       |      |