CentraleSupélec

## Semester 7

| ISP-PHY-S07-16 | **Physics S07** | **9 ECTS** |
|---|---|---|

| ISP-PHY-S07-37 | **Engineering Physics S07** | **4 ECTS** |
|---|---|---|

| ISP-PHY-S07-19 | **Mathematics S07** | **4 ECTS** |
|---|---|---|
| SPM-MAT-004 | 1 | Optimization | 25.0 h |
| PM-MAT-006 | 1 | Advanced Numerical Methods | 24.0 h |

| ISP-PHY-S07-24 | **Engineering and Systems S07** | **9 ECTS** |
|---|---|---|

| ISP-PHY-S07-10 | | **Humanities Management and Business Development S07** | **4 ECTS** |
|---|---|---|---|
| SPM-HEP-014 | 2 | Business Management and Transformation | 26.5 h |
| SPM-HEP-013 | P/F | Conferences | 10.0 h |
| SPM-HEP-019 | 1 | Human ressources Management | 18.0 h |
| SportS07 | P/F | Sport S07 | 21.0 h |

| ISP-PHY-S07-04 | | **Modern Languages S07** | **4 ECTS** |
|---|---|---|---|
| LV1S07 | 1 | Foreign Languages and Culture 1 | 21.0 h |
| LV2S07 | 1 | Foreign Languages and Culture 2 | 21.0 h |

# Semester 8

| ISP-PHY-S08-21 | **Engineering Physics S08** | **9 ECTS** |
|---|---|---|
| SPM-INF-004    1 | Introduction to Quantum Computing | 35.5 h |

| ISP-PHY-S08-26 | **Computing and Data Sciences S08** | **4 ECTS** |
|---|---|---|

| ISP-PHY-S08-29 | **Project and research S08** | **6 ECTS** |
|---|---|---|

| ISP-PHY-S08-11 | **Humanities Management and Business Development S08** | **7 ECTS** |
|---|---|---|
| SPM-HEP-011    1 | Engineer, environment and society | 14.0 h |
| SPM-HEP-018    1 | Controversy | 18.0 h |
| SPM-HEP-017    2 | Systems engineering | 21.5 h |
| SportS08    P/F | Sport S08 | 21.0 h |
| SPM-STA-002    4 | Engineering internship | 0.0 h |

| ISP-PHY-S08-05 | **Modern Languages S08** | **4 ECTS** |
|---|---|---|
| LV1S08    1 | Foreign Languages and Culture 1 | 21.0 h |
| LV2S08    1 | Foreign Languages and Culture 2 | 21.0 h |

## Optimization

**Course supervisor:** Michel Barret

**Total:** 25.0 h

**CM:** 10.5 h, **TD:** 4.5 h, **TP:** 9.0 h

**Evaluation methods:** 1h written test, can be retaken

**Evaluated skills:**

- Physical Modeling

- Data Processing

**Course supervisor:** Damien Rontani

**Total:** 24.0 h

CM: 10.5 h, **TD:** 4.5 h, **TP:** 9.0 h

**Bibliography:**

- Ref1 : référence à indiquer

**Evaluation methods:** Labwork report

**Evaluated skills:**

- Physical Modeling

## Business Management and Transformation

**Course supervisor:** Francis Dorveaux

**Total:** 26.5 h

**Evaluated skills:**

- Business Intelligence

## Conferences

**Course supervisor:** Damien Rontani, Hervé Frezza-Buet

**Total:** 10.0 h <span style="float:right">**CM:** 10.0 h</span>

## Human ressources Management

**Course supervisor:** Muriel Keller

**Total:** 18.0 h

**Evaluated skills:**

- Business Intelligence

# Sport S07

**Course supervisor:** Hervé Frezza-Buet

**Total:** 21.0 h
**TD:** 21.0 h

## Foreign Languages and Culture 1

**Course supervisor:** Elisabeth Leuba

**Total:** 21.0 h $\hfill$ **TD:** 21.0 h

**Description:** The first foreign language is generally English. Students are divided into level groups ; in class, work is not only focused on the 4 language competences but also on various topics studied in depth according to students' levels. Topics cover a range of fields, such as civilisation, society and the professional world. Limited class size enables active participation and significant improvement in the language. The educational approach is varied: group work, class presentations, specific exercises, research, debates, etc.

**Learning outcomes:** At the end of the course, students will have improved their ability to communicate in an international professional, academic or personal context.

**Evaluation methods:** Assessment will be by continuous assessment according to criteria to be determined by each teacher, taking into account personal investment in the course. Each course will be marked out of 20 at the end of the semester.

**Evaluated skills:**

- Management

## Foreign Languages and Culture 2

**Course supervisor:** Beate Mansanti

**Total:** 21.0 h                                                                 **TD:** 21.0 h

LV2S07

**Description:** Students are offered a range of second foreign languages at different levels, including for beginners. Students are divided into level groups; in class, work is not only focused on the 4 language competences but also on various topics studied in depth according to students' levels. Topics cover a range of fields, such as civilisation, society and the professional world. Limited class size enables active participation and significant improvement in the language. The educational approach is varied: group work, class presentations, specific exercises, research, debates, etc.

**Learning outcomes:** At the end of the course, students will have improved their ability to communicate in an international professional, academic or personal context.

**Evaluation methods:** Assessment will be by continuous assessment according to criteria to be determined by each teacher, taking into account personal investment in the course. Each course will be marked out of 20 at the end of the semester.

**Evaluated skills:**

- Management

## Introduction to Quantum Computing

**Course supervisor:** Damien Rontani, Stéphane Vialle

**Total:** 35.5 h  **CM:** 16.5 h, **TD:** 4.5 h, **TP:** 9.0 h, **Projet:** 5.5 h

**Bibliography:**

- Ref. [1] : R. Hundt, Quantum Computing for Programmers, Cambridge University Press (2022)

- Ref. [2] : P. Kaye, R. Laflamme, M. Mosca, An Introduction to Quantum Computing, Oxford University Press (2006)

**Evaluation methods:** Assessment of the mini project

**Evaluated skills:**

- Physical Engineering Design

- Physical Modeling

- Data Processing

- Systems Analysis

## Engineer, environment and society

**Course supervisor:** Julien Colin

**Total:** 14.0 h

**TD:** 14.0 h

## Controversy

**Course supervisor:** Hervé Frezza-Buet, Damien Rontani

**Total:** 18.0 h                                                                 **TD:** 18.0 h

**Evaluated skills:**

- Business Intelligence

**Course supervisor:** Virginie Galtier

**Total:** 21.5 h <span style="float:right">**CM:** 11.0 h, **TP:** 9.0 h</span>

**Evaluation methods:** Multiple-choice questions and case study (1.5 hours)

**Evaluated skills:**

- Systems Analysis

# Sport S08

**Course supervisor:** Hervé Frezza-Buet

**Total:** 21.0 h <span style="float:right">**TD:** 21.0 h</span>

## Engineering internship

**Course supervisor:** Hervé Frezza-Buet, Damien Rontani

**Evaluated skills:**

- Physical Engineering Design
- Physical Modeling
- Data Processing
- Systems Analysis
- Business Intelligence

# FOREIGN LANGUAGES AND CULTURE 1

**Course supervisor:** Elisabeth Leuba

**Total:** 21.0 h <span style="float:right">**TD:** 21.0 h</span>

**Description:** The first foreign language is generally English. Students are divided into level groups ; in class, work is not only focused on the 4 language competences but also on various topics studied in depth according to students' levels. Topics cover a range of fields, such as civilisation, society and the professional world. Limited class size enables active participation and significant improvement in the language. The educational approach is varied: group work, class presentations, specific exercises, research, debates, etc.

**Learning outcomes:** At the end of the course, students will have improved their ability to communicate in an international professional, academic or personal context.

**Evaluation methods:** Assessment will be by continuous assessment according to criteria to be determined by each teacher, taking into account personal investment in the course. Each course will be marked out of 20 at the end of the semester.

**Evaluated skills:**

- Management

**Course supervisor:** Beate Mansanti

**Total:** 21.0 h                                                                 **TD:** 21.0 h

**Description:** Students are offered a range of second foreign languages at different levels, including for beginners. Students are divided into level groups; in class, work is not only focused on the 4 language competences but also on various topics studied in depth according to students' levels. Topics cover a range of fields, such as civilisation, society and the professional world. Limited class size enables active participation and significant improvement in the language. The educational approach is varied: group work, class presentations, specific exercises, research, debates, etc.

**Learning outcomes:** At the end of the course, students will have improved their ability to communicate in an international professional, academic or personal context.

**Evaluation methods:** Assessment will be by continuous assessment according to criteria to be determined by each teacher, taking into account personal investment in the course. Each course will be marked out of 20 at the end of the semester.

**Evaluated skills:**

- Management