# BACHELOR, 3rd Year - 1st Semester (S5) [JME5ST0]

| UE | Course | ECTS | Language |
|---|---|---|---|
| **JME5U1** | **MECHANICS AND ENERGY: FUNDAMENTALS** | **13** | |
| | Continuum Mechanics | |  |
| | Thermodynamics | |  |
| | Elasticity-Strength of Materials | | |
| | Introduction to Fluid Mechanics | |  |
| | Practicals | |  |
| | Refresher Course | |  |
| **JME5U2** | **TOOLS FOR THE ENGINEERS** | **11** | |
| | Mathematics for Engineering | |  |
| | Algebra | |  |
| | Information and Communication Technologies | |  |
| | IT for Engineering | |  |
| | Introduction to CAD and BIM | |  |
| | Measurement: Pressure, Flow rate, Temperature | |  |
| **JME5U4** | **LANGUAGES AND SOCIAL SCIENCE, HUMANITIES, ECONOMICS, LAW I** | **6** | |
| | English | |  |
| | TOEIC | | |
| | MOUV project (Openness project with interdisciplinary teams) | |  |
| | Intercultural management | |  |
| | Organization and operation of the companies | |  |
| | Numerical responsibility | |  |

# BACHELOR, 3rd Year - 2nd Semester (S6) [JME6ST0]

| UE | Course | ECTS | Language |
|---|---|---|---|
| **JME6U1** | **ENERGETICS** | **6** | |
| | Introduction to Heat Transfer | | FR |
| | Thermodynamics Machines | | FR / EN |
| | Practicals | | FR |
| | Refresher Course | | FR |
| **JME6U2** | **MECHANICS** | **10** | |
| | Mechanics and Real Fluids | | FR |
| | Mechanics of Real Fluids | | FR |
| | Optics and Acoustics | | FR |
| | Solid and Fluid materials | | FR |
| | Practicals | | FR |
| | Refresher Course | | FR |
| **JME6U3** | **TOOLS FOR THE ENGINEERS** | **5** | |
| | Numerical Methods | | FR |
| | Scientific Calculation and programming | | FR |
| | Technology | | FR |
| | Automation | | |
| | Refresher Course | | FR |
| **JME6U4** | **LANGUAGES AND SOCIAL SCIENCE, HUMANITIES, ECONOMICS, LAW II** | **6** | |
| | English | | EN |
| | TOEIC | | EN |
| | MOUV project (Openness project with interdisciplinary teams) | | FR |
| | Corporate financial management | | FR |
| | Professional Personal project I | | FR |
| | Sustainable Development and Societal Responsability | | FR |
| **JME6U5** | **WORK PLACEMENT I (Internship)** | 3 | FR / EN |

# MASTER, 1st Year - 1st Semester (S7) [JME7ST0]

| UE | Course | ECTS | Language |
|---|---|---|---|
| **JME7U1B** | **ENERGETICS: FUNDAMENTALS** | **12** | |
| | Conduction | |  |
| | Convection | |  |
| | Radiation | |  |
| | Phase Change | |  |
| | Semi-transparent media | |  |
| | Combustion I | |  |
| | Practicals | |  |
| **JME7U2B** | **FLUID MECHANICS** | **8** | |
| | Compressible Fluid Mechanics | |  |
| | Hydraulics and Aeraulics | |  |
| | Practicals | |  |
| **JME7U3B** | **TOOLS FOR THE ENGINEERS** | **6** | |
| | Computing Tools for Engineering I: Matlab | |  |
| | Computing Tools for Engineering II: VisualBasic | |  |
| | Process Control | |  |
| | Signal Processing | |  |
| **JME7U5** | **LANGUAGES AND SOCIAL SCIENCE, HUMANITIES, ECONOMICS, LAW III** | **4** | |
| | English | |  |
| | TOEIC | |  |
| | Challenge S7 | |  |
| | Commercial management and marketing | |  |
| | Quality Management | |  |
| | Project Management | |  |

# MASTER, 1st Year - 2nd Semester (S8) [JME8ST0]

| UE | Course | ECTS | Language |
|---|---|---|---|
| **JME8UE1** | **ENERGY COMPONENTS AND SYSTEMS** | **4** | |
| | Energy Systems | |  |
| | Heat Exchangers | |  |
| | Energy Transition | |  |
| | Solar Energy | |  |
| **JME8UE2** | **ENERGY EFFICIENCY** | **4** | |
| | Building energetics and regulations | |  |
| | Heating, Ventilation and Air Conditioning | |  |
| | Thermal Simulation of Buildings | |  |
| **JME8UE3** | **MODELLING AND SIMULATION IN MECHANICS AND ENERGY** | **8** | |
| | Numerical method for heat transfers | |  |
| | Flow Simulation | |  |
| | Turbulence | |  |
| | Mechanics of granular media | |  |
| | Numerical simulation of industrial systems | |  |
| **JME8UE3** | **DESIGN OFFICE AND RESEARCH PROJECT** | **4** | |
| | Design office | |  |
| | TAPIR: one week doing research with the teachers | |  |
| **JME8UE5** | **LANGUAGES AND SOCIAL SCIENCE, HUMANITIES, ECONOMICS, LAW IV** | **4** | |
| | English | |  |
| | TOEIC | |  |
| | Responsible Management | |  |
| | Innovation and Entrepreneurship | |  |
| | Professional Personal Project II | |  |

# MASTER, 2nd Year - 1st Semester (S9) [JME9ST0] – Part 1

| UE | Course | ECTS | Language |
|---|---|---|---|
| **JME9U1** | **MECHANICS AND ENERGY** | **8** | |
| | Nuclear Engineering | |  |
| | Industrial Processes (visits) and high temperature materials | | |
| | Finite Elements Modelling | | |
| | Methods and Decision Support Tools | | |
| | Life Cycle Analysis | | |
| **JME9U2** | **LANGUAGES AND SOCIAL SCIENCE, HUMANITIES, ECONOMICS, LAW V** | **3** | |
| | English | |  |
| | TOEIC | | |
| **JME9U3** | **TAI: ENDING PROJECT WITH INDUSTRIAL APPLICATION** | **3** | |
| | TAI: Ending project with industrial application | |  |
| | | | |
| | **OPTIONNAL TRACKS TO BE CHOSEN: 1 out of 3 (see next page)** | | |

# MASTER, 2nd Year - 1st Semester (S9) [JME9ST0] – Part 2

| | | |
|---|---|---|
| **JME9U4A** | **OPTION/TRACK 1: INDUSTRIAL AND NATURAL RISKS I**<br>Industrial Security<br>Safety of Operation<br>Explosive Materials, Explosions<br>Combustion II<br>Simulation of Detonation Waves<br>Radiation, Monte-Carlo Methods and Flow | **8** |
| **JME9U4B** | **OPTION/TRACK 1: INDUSTRIAL AND NATURAL RISKS II**<br>Propagation of Wildfires and “Small World” Approach<br>Compartmented fires in urban areas<br>Combustion III<br>Simulation of Fires<br>Natural Risks | **8** |
| **JME9U5A** | **OPTION/TRACK 2: ENERGY PRODUCTION AND DISTRIBUTION**<br>Wind Energy and Tidal Energy<br>Waste and Biomass Valorization<br>Fuel Cells and Geothermal Energy<br>Energy Storage<br>Energy distribution network and Markets | **8** |
| **JME9U5B** | **OPTION/TRACK 2: OPTIMIZATION OF ENERGY SYSTEMS**<br>Thermal metrology, processes<br>Dynamics of Energy Systems<br>Heat Exchangers II<br>Methods for the Energy Optimization<br>Sustainable, Bioclimatic and Energy Positive Buildings | **8** |
| **JME9U6A** | **OPTION/TRACK 3: ADVANCED NUMERICAL MODELING IN FLUID MECHANICS AND HEAT TRANSFERS I**<br>Incompressible Fluid Flow I<br>Two-phase flows<br>Interface Tracking method and Algorithm<br>Thermo-Mechanics<br>Instability in Fluid Mechanics: computations (Ritchmyer-Meshkov)<br>High Performance Computing I | **8** |
| **JME9U6B** | **OPTION/TRACK 3: ADVANCED NUMERICAL MODELING IN FLUID MECHANICS AND HEAT TRANSFERS II**<br>Incompressible Fluid Flow II<br>Numerical Modelling of Instabilities<br>Multiphase flow: Gas-Particles<br>High Performance Computing II: parallel computing<br>Finite Volume Method: 1D to multiD | **8** |

# MASTER, 2nd Year - 2nd Semester (S10) [JME10ST0]

| UE | Main course | ECTS | Language |
|---|---|---|---|
| JME10U1 | WORK PLACEMENT III (Internship) | 30 | / |