	General training	Materials	Materials mechanics and processes	Materials characterization	Computing / Modelling
1st semester	General training 1 – 50 h 1. French and/or English 2. Social and environmental responsibilities 3. Materials in society / Resources 4. Scientific writing and presenting	Materials 1 – 70 h **J. Favre** 1. Introduction on microstructure/properties relationship 2. Basics of crystal structures 3. Phase diagrams 4. Solid state phase transformations 5. Solidification 6. Selection of materials	Materials mechanics 1 – 50 h **P. Baral** 1. Basics of continuum mechanics 2. Elasticity 3. Plasticity	Materials characterization 1 – 50 h **C. Maurice** 1. Light microscopy (metallography) 2. Electron microscopy 3. Microanalysis 4. EBSD	Computing 1 – 50 h **R. Ferrier** 1. Mathematics / Vector analysis 2. Data treatment and statistics 3. Measurement and uncertainty 4. Basics of computing in Matlab or Python
2nd semester	General training 2 – 50 h 1. French and/or English 2. Bibliographic survey – Analysis of scientific papers 3. Life cycle analysis / Re-using / Recycling 4. Preparation to professional life	Materials 2 – 70 h **F. Christien** 1. Crystals defects 2. Physics of plastic deformation 3. Solid state diffusion 4. Surface and interfaces in materials 5. Mechanisms of crystallographic texture formation	Materials mechanics 2 – 50 h **A. Dréano** 1. Failure / Fracture 2. Mechanical testing 3. Creep and fatigue	Materials characterization 2 – 50 h **A. Borbely** 1. X-ray diffraction 2. Other X-ray based methods (X-ray fluorescence, X-ray tomography) 3. Mass spectrometry 4. Thermal analysis	Computing 2 – 24 h **A. Aoufi** 1. Introduction to FEM modelling using Python and Abaqus for linear stationnary thermo-elasticity problems
3rd semester	General training 2 – 50 + 200 h **F. Christien** 1. French and/or English 2. Project management 3. Seminars 4. Lab project	Materials 3 – 70 h Durability of materials **C. Bosch** 1. Electrochemical corrosion 2. Environment sensitive fracture 3. Tribology, wear, tribo-corrosion	Materials processes – 50 h **H. Klocker** 1. Plastic forming and thermomechanical treatments 2. Additive manufacturing	Materials characterization 3 – 50 h **V. Barnier** 1. Surface analysis (XPS) 2. AFM based methods 3. Micromechanics methods	Computing 3 – 50 h 1. FEM modelling (time-dependant, non-linear) 2. Other modelling methods in materials science
4th semester	Five to six month internship				