

Master 2 Computations in Civil and Coastal Engineering

Semester 3

Course Title	Course Description	ECTS
<ul style="list-style-type: none"> Advanced mechanics and computational modelling 	<p>This course is designed to provide students with theoretical and practical skills to understand and perform non linear computations.</p> <ul style="list-style-type: none"> Non linear behaviour of materials : Plasticity, damage (8h) Numerical methods for non-linear problems (6h) Computational dynamics of structures (6h) Practical works, use of a Finite Element Program (Cast3M) (12h) Numerical project (10h + 40h) 	<p>41 + 40H</p> <p>8 ECTS</p>
<ul style="list-style-type: none"> Modelling and Simulation in Coastal Engineering 	<p>This course aims at giving the first elements in numerical simulation in coastal engineering.</p> <ul style="list-style-type: none"> Non linear shallow water equations (7,5h) Berkhoff equations and other wave agitation models (6h) Numerical project (22,5h) 	<p>36H</p> <p>4 ECTS</p>
<ul style="list-style-type: none"> Advanced Geotechnics and hydrogeology 	<p>This course aims to introduce the theory and practice of the design of superficial and deep foundations as well as the hydrological cycle with specific reference to the interaction between soil and the environment.</p> <p>The part on foundations will introduce : (33H)</p> <ul style="list-style-type: none"> Limit analysis for the design of superficial foundations. (7.5H) Prediction of bearing capacity and settlements of superficial foundations (7.5H) Design of piled foundation subjected to vertical and horizontal loads (18H) <p>The part on hydrogeology will introduce : (24H)</p> <ul style="list-style-type: none"> Hydrological cycle and water balance (6H) Transient and steady state processes in groundwater movement (6H) Yielding of wells and pumping analysis (6H) Hydrological risks and return period (6H) 	<p>57H</p> <p>6 ECTS</p>
<ul style="list-style-type: none"> Advanced Modelling and Simulation in Coastal Engineering 	<p>The aim of this course is to complement the formation of students in computational coastal engineering with the most advanced wave models</p> <ul style="list-style-type: none"> Boussinesq and Green Naghdi models (15H) Wave models based on Navier-Stokes equations (15H) Numerical project (20H) 	<p>50H</p> <p>6 ECTS</p>
<ul style="list-style-type: none"> French as a Foreign Language, English 		<p>30H</p> <p>3 ECTS</p>
<ul style="list-style-type: none"> Bibliography 		<p>30H</p> <p>3 ECTS</p>
Semester 4		
<ul style="list-style-type: none"> Research internship 		30 ECTS