

Course offered for the STAT PhD program starting from a.y. 2019/2020

TITLE	<b>TECTONOPHYSICS</b>
Lecturer	Massimo Verdoya
Duration and Credits	4 CFU* * Upon request, the course may be extended to 6 CFU
Course description	<p>The course focuses on the main dynamic processes occurring in the mantle and lithosphere. It presents simple geophysical models that use surface geophysical constraints to estimate the order of magnitude of the dynamic processes. It relates tectonics with seismic activity and addresses the repercussions of the deep processes and the internal structure on the lithosphere mechanical behavior. Lectures address the following topics:</p> <ul style="list-style-type: none"> <li>- <i>Internal structure and composition</i>: sonic velocity distribution, Clapeyron curve.</li> <li>- <i>Mantle rheology and dynamics</i>: time-scale, deformation mechanisms and viscosity.</li> </ul> <p><i>Thermal state</i>: conduction and diffusion, terrestrial heat flow, plate cooling models, advection, Gruneisen parameter, adiabatic thermal gradient, convection and buoyancy forces, non-dimensional numbers.</p> <p><i>Lithosphere plates</i>: thermal boundary layer, kinematics and forces acting on plates, mechanical behavior, plate convergence and thinning of continental lithosphere.</p> <p>Prerequisites: Master degree in Earth sciences/environment sciences; basic knowledge of geophysics, petrology and geology.</p>
Course organization	Frontal lectures
Teaching period	January-March