

TEACHING COURSE TITLE:			
STRUCTURAL GEOLOGY FIELD COURSE			
Scientific - Disciplinary sector: GEO/03		CFU: 6 (2 LF + 2 LAB + 2 AC)	Total hours: 72
Study hours per activity:	Frontal lectures: 2	Laboratory: 1	Fieldwork: 0.56
Type of training activity: <i>characterizing</i>			
SYLLABUS			
Prerequisites: Mandatory: basic knowledge of fundamental principles of Structural Geology. Desirable: knowledge of Gis, Microsoft Excel and Power Point, and any drawing software (e. g., Inkscape, Canvas, Corel Draw or similar).			
Frontal lectures			
Number of hours: 4	Topic: Introduction. Strain in rocks. Ductile vs. brittle deformation. Geological faults. Fault geometrical elements. Determination of fault offset and sense of movement. Fault analysis on horizon maps and on cross-sections. Fault 3D shape and displacement distribution. Throw partitioning.		
Number of hours: 4	Topic: Fault systems and relay zones. Coherence in fault systems. Displacement variations and conservation. Fault segmentation. Relay zones and displacement transfer processes. Relay zone evolution and breaching processes. Impact of relay zones on fluid flow.		
Number of hours: 2	Topic: The birth, growth, and death of faults. Fault architecture. Fault rocks. Fault rock thickness vs. displacement curve. Geometric model of fault zone growth. Displacement vs. length curve. Traditional fault growth model. Alternative fault growth model. The death of faults.		
Number of hours: 4	Topic: Fault-related deformation and complexities. Up to yourselves!		
Number of hours: 2	Topic: 3D fault structure and evolution. Concepts of relay zone type, orientation, and sense of stepping. Relay zone breaching in 3D. Geological controls on relay zone 3D structure. Variability on 3D fault structure at outcrop resolution.		
Laboratory			
Number of hours: 4	2D mapping of complex fault systems (using GIS and <i>drawing software</i>)		
Number of hours: 8	Throw profiles construction (using Microsoft Power Point , <i>drawing software</i> and Microsoft Excel)		
Number of hours: 4	Reading of scientific articles on fault-related topics and presentation preparation (using Microsoft Power Point)		
Number of hours: 8	Analysis and elaboration of fault data collected in the field (using <i>drawing software</i> , and Microsoft Excel and Power Point)		
Fieldwork			

Number of hours: 32	Detailed analysis of faults in outcrop
Expected learning outcomes	
<p>Knowledge and understanding The student should demonstrate knowledge and understanding of fault zone structure and evolution in 2D and in 3D. The student should be ready to be engaged in discussions on geological faults. The course aims to provide an advanced understanding fault zone structure and evolution, and to enable students to acquire a specialized knowledge on this topic.</p>	
<p>Applying knowledge and understanding The student should demonstrate ability in analysing and understanding fault zones, and in their detailed mapping at various scales.</p>	
<p>Making judgements The student should be able to analyse fault zones and understand tectonic processes, and to produce structural maps and plots. The course aims to provide the student with the cognitive and methodological tools necessary to autonomously analyse faults at different scales.</p>	
<p>Communication skills The student should be able to communicate, to a non-expert audience or to a colleague with a different background (e.g. engineer), the basic principles of the analysis and understanding of fault systems. The student should be able to present and discuss structural sketches, maps and plots.</p>	
<p>Learning skills The student should be able to carry out a bibliographic research and to attend advanced seminars, conference and meetings on structural topics.</p>	
Method of learning assessment	
<p>Final exam Oral discussion on the works produced during the laboratory and fieldwork activities, with references to the theoretical aspects debated in the frontal lectures.</p>	