1. GEODYNAMICS COURSE DESCRIPTION

This course is worth 7.5 ECTS credits at the Master's level and will be in English. The course runs through period 1 of the 2026 autumn term.

2. INSTRUCTOR INFORMATION

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3. PRE-REQUISITES

Access to the course requires knowledge equivalent to a bachelor's degree with at least 90 credits in geology or geoscience, including the courses Petrology 15 credits (GG4048) and Tectonics 7.5 credits (GG5050). English 6.

4. COURSE CONTENTS

This course introduces advanced topics relevant to geodynamics such as the composition and evolution of the mantle and lithosphere, and the structure and mechanics of continental rifts and subduction/collisional orogens. The course introduces a wide range of concepts necessary for integrating mantle and lithospheric processes into a plate tectonic framework, such as the i) theoretical basis for conceptualizing mantle flow and its consequences; ii) theoretical basis for understanding heat flow in the crust; iii) exhumation mechanisms of deep-seated crust related to orogeny. The course also provides an introduction to the numerical and analogue modelling of these parameters.

5. COURSE STRUCTURE

The course is equivalent to a full-time study load for a five week period. Teaching is conducted through lectures, projects, laboratories, and seminars. Weekly seminars will be based on reading and discussion of articles, projects as well as presentation of written and oral summaries.

6. LEARNING OUTCOMES

After completion of this course, students should be able to:

- Apply and critically evaluate the key physical theories used to constrain the properties of the mantle and lithosphere and their mechanical behavior;

- Outline the thermodynamical constraints associated with heat-flow in the Earth's crust, and apply thermodynamic modeling to constrain pressure-temperature paths as recorded by rocks;
- Describe and interpret geological data in order to extract relevant information for constraining geodynamical models.
- Analyze realistic plate tectonic scenarios in different geodynamic settings.

7. REQUIRED TEXT

All course material is available on Canvas.

8. COURSE ASSESSMENT AND EXAMINATION

There is no final exam for this course. The final grade will be based on the following:

Map project (Intro week) 10% – a short 2-days map project. This assignment requires an individually written report and should demonstrate your knowledge of reading geological maps.

Weekly project 60% – a weekly project on the weekly topic (4 weeks, 4 projects). The projects are linked to the topics and reading assignments. This assignment requires an individually written report due each week and should demonstrate your understanding of the exercise and the weekly topic.

Seminar-Workshop (30%) – The Seminar-Workshop consists of two different moments. In the first one, students (divided in groups) will provide a short oral overview of the paper, summarizing its major points, highlighting strengths/weaknesses, and identifying points which require further clarification during seminar discussion. This first moment is associated with the preparation of a Power Point Presentation. The evaluation will consider (i) the demonstrated knowledge and comprehension of reading assignments via active participation in discussion and direct queries and (ii) leading the seminar demonstrating preparation, e.g. – pre-defined questions/points of discussion. In the second moment, the project will be presented by the students and discussed together.

All assignments will be graded with points. You must pass all assignments to pass the course.

The bologna grading scheme will be applied.

Credits	ECTS grade	Older system
0-39.5%	F	Fail
40-49.5%	Fx	

50-59.5%	E	Pass
60-69.5%	D	
70-79.5%	C	
80-89.5%	B	Pass with distinction
90-100%	A	