

Course diary - Calculus (module A)
B.A. in Global Governance, Fall 2026
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- **Lesson 1** [14/09/2026] Introduction of the course. Application of mathematics (tax rate, minimum wage). Functions. Graph a function. x-intercept, y-intercept. Examples: linear functions, quadratic functions, square root.
- **Lesson 2** [15/09/2026] Examples of functions, domain. Linear functions, quadratic functions. Intervals of real numbers, piecewise linear functions (Italian tax rate). Absolute value, signature, rational functions, roots.
- **Lesson 3** [17/09/2026] Definition of limit and non-existence of limit. Quadratic functions, signature, linear functions, constant functions. Rules of limits for sum, difference, product and quotient. Examples.
- **Lesson 4** [21/09/2026] Infinite limits, examples, graph of diverging functions. Limits to infinity, one-sided limit. Rules of limits to infinity, crop yield model, tuition discount example.
- **Lesson 5** [22/09/2026] Continuity, definition and examples. Rules of continuity. Continuity of functions defined in two adjacent intervals. Continuity on a closed interval. The intermediate value theorem, idea of the proof, application to the existence of square root.
- **Lesson 6** [23/09/2026] Exercises on functions, domains, limits and continuity.
- **Lesson 7** [24/09/2026] Definition of natural, integer and rational powers, power functions. Definition of exponential functions, examples, basic properties and graphs. Population growth, radioactive decay and interest as examples of exponential functions. Napier's number. Polynomial vs exponential.
(planned)
- **Lesson 8** [28/09/2026] Logarithm.
- **Lesson 9** [29/09/2026] Trigonometric functions.
- **Lesson 10** [30/09/2026] Differentiation.
- **Lesson 11** [01/10/2026] Rules of differentiation.
- **Lesson 12** [05/10/2026] Chain rule.
- **Lesson 13** [06/10/2026] Higher order derivatives.
- **Lesson 14** [07/10/2026] Exercises.