



LémanMaturité

Swiss Matura Curriculum

Summary

Swiss
Matura

$$y(t) = t^2 e^t \Rightarrow y'(t) - \frac{y(t)}{t} = t e^t \quad (\text{E}) \quad \text{sur }]0, \infty[$$
$$y'(t) - \frac{y(t)}{t} = 0 \quad (\text{H})$$

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First Partial

Swiss
Matura



Physics

Core discipline of the Swiss Matura

Curriculum Content:

1. Mechanics

- Kinematics: MRU, MRUA, circular motion; graphs and trajectories
- Dynamics: forces, Newton's laws, inclined plane, vector projections
- Work, power, efficiency; conservative and non-conservative forces
- Linear momentum, impulse, collisions
- Gravitation: Kepler's laws, orbital motion (circular & introduction to elliptical orbits)

2. Electricity & Magnetism

- Electrostatics: electric charge, Coulomb's law; electric field & potential
- DC circuits: resistors, Ohm's law, electrical power, resistivity (revision)
- Magnetic fields from currents; electromagnets; magnetic force on currents
- Lorentz and Laplace forces; charge motion in magnetic fields
- Simple induction phenomena (intro level)

3. Waves, Optics & Thermal Physics

- Mechanical waves: frequency, wavelength, transverse/longitudinal waves
- Electromagnetic waves & sound; basic interference principles
- Geometric optics: image formation, lenses & mirrors (intro)
- Temperature vs heat; calorimetry; phase changes; heat transfer modes
- Ideal gas law; thermal expansion; conservation of energy in thermal processes

4. Atomic, Nuclear & Fluid Physics

- Structure of atoms & nuclei; α , β , γ decay; consequences & shielding
- Radioactive decay curves; half-life (revision)
- Fluid statics: pressure, hydrostatic pressure, Pascal's principle, Archimedes' buoyant force; Torricelli's law
- Simple models linking physics to real-world technologies

Exam Format in the Swiss Matura:

Written exam — 80 minutes

- Multiple-choice questions and structured physics problems
- Covers mechanics, waves, electricity, thermodynamics, and introductory modern physics
- Evaluation of reasoning, calculations, and interpretation of physical situations

No oral component



Biology

Core discipline of the Swiss Matura

Curriculum Content:

1. Cells & Molecular Foundations

- Cell structure, organelles, and microscopy
- Biological molecules: proteins, lipids, carbohydrates, nucleic acids
- Enzymes: structure, function, catalytic activity
- Membrane transport: diffusion, osmosis
- Basics of energy flow in cells (ATP, respiration, fermentation)

2. Genetics & Evolution

- DNA structure, replication, and gene expression
- Chromosomes, mitosis, meiosis, inheritance patterns
- Mutations and genetic variability
- Principles of natural selection and evolutionary change
- Population genetics (conceptual understanding)

3. Human Biology & Physiology

- Nervous and endocrine regulation
- Cardiovascular and respiratory systems
- Digestive and excretory systems; homeostasis
- Immune responses and defense mechanisms
- Thermal regulation & energy balance
- Reproduction and development

4. Ecology & Environment

- Ecosystems: energy flow, nutrient cycles, trophic levels
- Population and community interactions
- Environmental factors and ecological niches
- Human impact on ecosystems: pollution, biodiversity loss
- Sustainable resource use and conservation principles

Exam Format in the Swiss Matura:

Written exam — 80 minutes

- Multiple-choice questions (MCQs)
- Short structured problems covering the full curriculum

No oral component



Chemistry

Core discipline of the Swiss Matura

Curriculum Content:

1. Structure of Matter

- Atomic structure, isotopes, ions
- Electron configuration (qualitative), periodic table trends
- Chemical bonding: ionic, covalent, metallic
- Molecular geometry and polarity
- Intermolecular forces and physical properties
- States of matter and changes of state

2. Chemical Reactions & Stoichiometry

- Chemical equations, mole concept, Avogadro's number
- Stoichiometric calculations and limiting reagents
- Reaction types: synthesis, decomposition, combustion, acid–base, precipitation
- Neutralisation and titration (indicators, equivalence point)
- Redox equations: oxidation and reduction, oxidation numbers

3. Solutions, Acids & Bases

- Concentration units (mass %, mol/L), dilution calculations
- Solubility and precipitation reactions
- Electrolytes vs nonelectrolytes
- Acids and bases: properties, pH scale, neutralisation
- pH calculations for strong acids, strong bases, and acid–base mixtures

4. Thermodynamics & Reaction

- Gas laws: Boyle, Charles, ideal gas model
- Kinetics basics: factors affecting reaction rate
- Chemical equilibrium: dynamic nature, Le Châtelier's principle
- Electrochemistry basics: galvanic cell concept, applications
- Organic chemistry essentials: alkanes, alkenes, alkynes, alcohols, esters, carboxylic acids

Exam Format in the Swiss Matura:

Written exam – 80 minutes

- Several multi-step problems covering the full curriculum
- Combination of theoretical explanations, calculations, and interpretation of chemical data

No oral component



Arts

Core discipline of the Swiss Matura

Curriculum Content:

1. Visual Language & Representation

- Observation and drawing from life (objects, spaces, figures)
- Line, shape, value, texture, and color as tools of expression
- Perspective, proportion, and spatial construction
- Symbolism and visual communication
- Sketching, visual research, and exploratory studies

2. Techniques & Creative Process

- Exploration of traditional and modern media
- Experimentation with mixed techniques and textures
- Artistic process: research, ideation, iteration, and final production
- Development of personal imagery and creative intention
- Safe and appropriate use of materials

3. Composition & Visual Analysis

- Principles of composition: balance, rhythm, contrast, emphasis
- Organization of visual space and narrative structure
- Analysis of artworks using formal and thematic criteria
- Image interpretation in cultural, social, and historical contexts
- Critical reflection on one's own artistic production

4. Art, Culture & Society

- Major artistic movements and their characteristics
- Understanding artworks in relation to time, place, and audience
- The role of images in media and contemporary culture
- Art as personal and collective expression
- Artistic literacy and cultural awareness

Exam Format in the Swiss Matura:

Written & practical exam — 3 hours

- A combination of practical tasks and analytical exercises
- Interpretation and analysis of artistic works or visual documents
- Evaluation of observation, technical skills, creativity, and visual communication

No oral component



History

Core discipline of the Swiss Matura

Curriculum Content:

1. Historical Methods & Sources

- Reading and interpreting primary and secondary sources
- Identifying causes, consequences, continuity, and change
- Understanding historical periods and chronology
- Critical analysis of documents, bias, and perspective

2. Revolutions & Transformations

- American Revolution: independence, Constitution, early foreign policy
- French Revolution: phases, Enlightenment influence, Declaration of the Rights of Man
- Swiss transformations (1798, 1848): from Helvetic conflicts to Federal State
- Congress of Vienna and restoration politics

3. Resources, Industrialisation & Social Change

- Industrial Revolution: economic and social transformations
- Urbanisation, labour conditions, early social movements
- New ideologies: liberalism, socialism, Marx
- Nation-building and political changes in Europe

4. Contemporary World & Civic Understanding

- World Wars: causes, major developments, consequences
- Totalitarian regimes and democratic evolution
- Decolonisation, Cold War, globalisation
- Switzerland: neutrality, social peace, political institutions

Exam Format in the Swiss Matura:

Written exam — 80 minutes

- Structured responses based on documents
- Explanation, contextualisation, and critical interpretation of sources

No oral component



Geography

Core discipline of the Swiss Matura

Curriculum Content:

1. Geography & Earth Systems

- Earth structure and dynamics: internal layers, tectonic plates, volcanism
- Relief formation: mountains, erosion, karst landscapes, soils
- Hydrosphere: water cycle, rivers, lakes, oceans, glaciers
- Atmosphere: temperature, humidity, pressure, winds, storms, climate patterns

2. Human Geography & Societies

- Population distribution, growth, migration
- Urbanisation, settlement patterns, spatial planning
- Economic activities: agriculture, industry, services
- Human diversity: ethnicities, cultures, civilisations

3. Resources & Environmental Management

- Natural resources: water, soils, energy; use, scarcity, sustainability
- Environmental degradation, pollution, and biodiversity loss
- Land-use conflicts and territorial planning
- Sustainable development strategies

4. Geographic Methods & Tools

- Reading and interpreting maps, scales, and coordinates
- Graphs, diagrams, thematic cartography • Spatial data analysis
- Critical interpretation of geographic documents and media

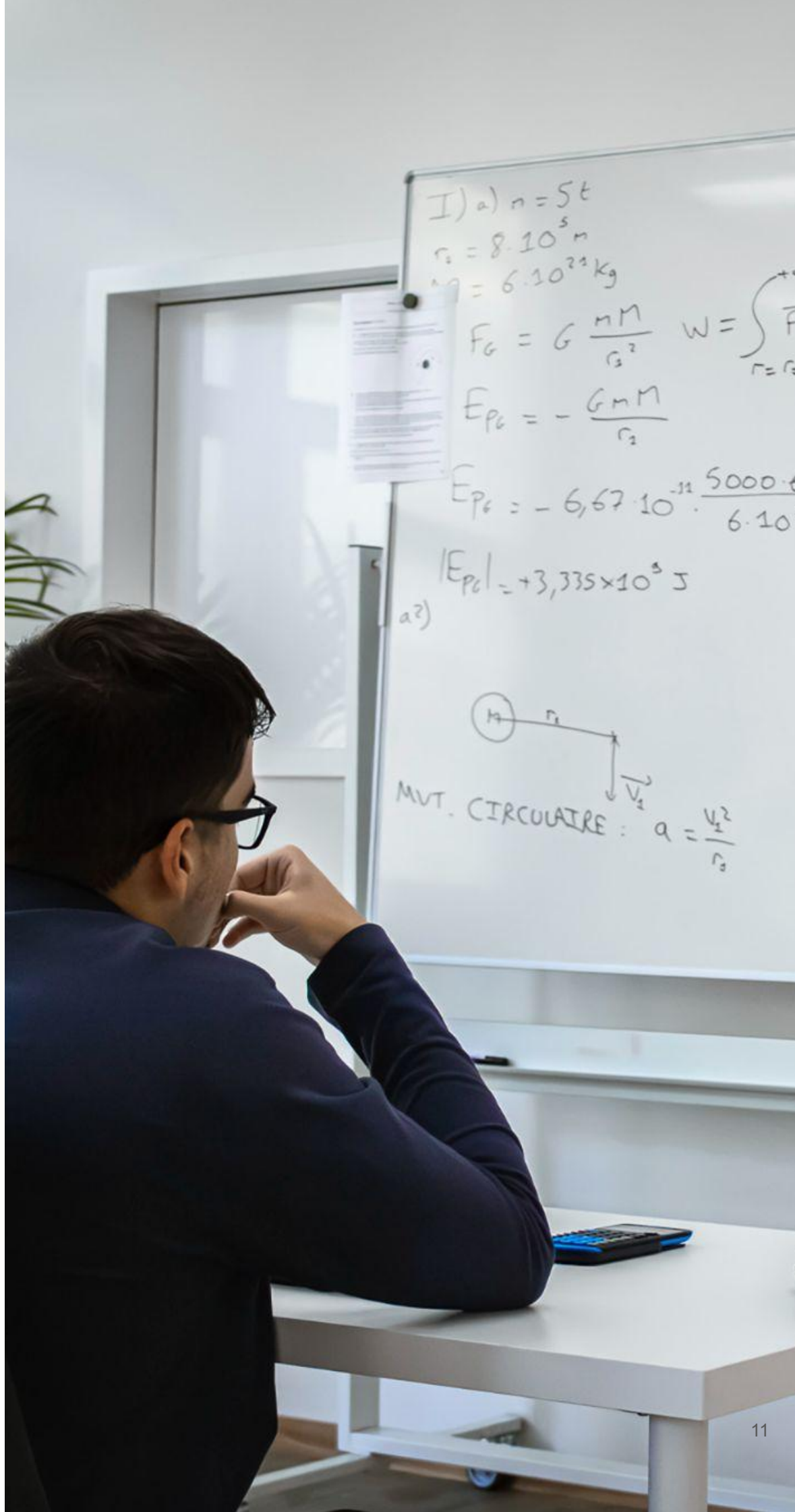
Exam Format in the Swiss Matura:

Written exam – 80 minutes

- Several structured questions covering the full curriculum
- Possible interdisciplinary links with biology, chemistry, or physics

No oral component









Swiss Matura Second Partial



French

Core discipline of the Swiss Matura

Curriculum Content:

1. Reading & Text Interpretation

- Close reading of literary and informational texts
- Identification of themes, arguments, tone, and rhetorical devices
- Analysis of narrative structure, point of view, and stylistic choices
- Interpretation of texts from different periods and genres

2. Literature & Cultural Perspectives

- Study of major literary movements and authors
- Examination of poetry, theatre, novel, and essays
- Historical and cultural context of works • Comparative approaches to themes, characters, and writing styles
- The programme includes six literature modules (corpus studied across the year)

3. Writing & Communication

- Argumentative, analytical, and reflective writing
- Clear structuring of ideas (introduction, development, conclusion)
- Coherent and precise expression adapted to purpose and audience
- Mastery of citation, reformulation, and textual justification

4. Language Competence & Grammar

- Grammar, syntax, and sentence construction
- Vocabulary expansion and stylistic variation
- Cohesion and coherence in long-form writing
- Correct usage, orthography, grammar, and stylistic control

Exam Format in the Swiss Matura:

Written exam – 4 hours

- Text analysis and/or argumentative essay
- Evaluation of comprehension, interpretation, structure, and quality of written expression

Oral component

- Commentary or analysis of a text or theme selected by the examiner
- Assessment of clarity, precision, reasoning, and linguistic accuracy



Languages

Core discipline of the Swiss Matura

Languages studied at LemanMaturité: English and German or Italian

Curriculum Content:

1. Oral Communication

- Comprehension of authentic spoken material (conversations, interviews, media)
- Interaction: discussions, explanations, spontaneous exchanges
- Pronunciation, fluency, and accuracy adapted to level (Std vs Adv)
- Presentation and justification of personal viewpoints

2. Reading & Text Interpretation

- Understanding literary and non-literary texts from various genres
- Identifying themes, tone, structure, communicative purpose
- Interpretation of cultural and historical references
- For advanced level: deeper analysis of style, argumentation, and author intention
- Reading programme: three works (four at advanced level)

3. Writing Skills

- Producing coherent texts: summaries, letters, commentaries, essays
- Structuring arguments and expressing opinions clearly
- Precision in vocabulary, grammar, and register
- For advanced level: refined stylistic control and more complex writing tasks

4. Structures & Cultural Context

- Grammar and syntax appropriate to level (tenses, clauses, connectors, morphology)
- Vocabulary expansion and idiomatic expressions
- Cultural knowledge: society, traditions, contemporary issues
- For advanced level: detailed cultural interpretation and critical comparison

Exam Format in the Swiss Matura:

Written exam — 3 hours

- Text comprehension and written production
- Tasks adapted to level:
 - Standard: clear, structured communication
 - Advanced: deeper textual analysis and extended writing

Oral component

- Commentary on a text or theme
- Evaluation of fluency, accuracy, and cultural understanding



Mathematics

Core discipline of the Swiss Matura

Curriculum Content:

1. Algebra & Equations

- Linear equations and systems (1–3 unknowns)
- Quadratic equations: formula, factorisation, related equations
- Simple inequalities in one variable

2. Functions & Graphs

- Elementary functions: polynomials, powers, roots, absolute value, exponential, logarithmic, sine, cosine
- Domain, basic properties, and graphs of these functions
- Graph transformations
- Intuitive notions of limit, continuity, and asymptotes

3. Calculus & Optimisation

- Derivatives of standard functions and simple combinations
- Using the derivative to study variation and extrema
- Tangent line to a curve
- Introduction to primitives, integrals, and area under a curve

4. Geometry, Trigonometry & Probability

- Trigonometry in triangles and on the unit circle (sine, cosine, tangent)
- Basic plane and spatial geometry: vectors, lines, distances, angles
- Descriptive statistics: simple diagrams, mean, median, variance, standard deviation
- Elementary probability and tree diagrams, including conditional probability

Exam Format in the Swiss Matura:

Written exam – 4 hours

- Several multi-step problems covering the full curriculum
- Problems mix theory, applications, modelling, and interpretation

Oral component

- Explanation of a theorem, proof, or problem
- Evaluation of clarity, reasoning, and correct mathematical language



Mathematics (Advanced Level)

Core discipline of the Swiss Matura

Curriculum Content:

1. Algebra & Complex Numbers

- Polynomial equations; factorisation & parameter problems
- Systems of equations with parameters
- Complex numbers: algebraic & trigonometric forms
- Modulus, argument, De Moivre, roots of complex equations

2. Functions & Analysis

- Extended elementary functions & transformations
- Limits, continuity, asymptotes
- Derivatives (incl. composite) & curve study
- Primitives & integrals; area; simple substitutions

3. Geometry & Trigonometry

- Trig identities & addition formulas
- Solving general trig equations
- Vector & analytic geometry in 2D/3D
- Functions & Analysis
- Lines, planes, distances, scalar product

4. Probability & Statistics

- Descriptive statistics (mean, median, variance)
- Probability laws; independence & conditional probability
- Tree diagrams & simple combinatorics
- Applications to modelling & data interpretation

Exam Format in the Swiss Matura:

Written exam — 4 hours

- Problems requiring extended reasoning, modelling, and multi-step algebraic or analytic methods
- Includes advanced topics: complex numbers, trigonometry, geometry, and calculus

Oral component

- Development of a topic or problem chosen by the examiner
- Assessment of precision, reasoning, and clarity in mathematical language



Mathematics–Physics (OS)

Specific Option — Swiss Matura

Curriculum Content:

1. Advanced Algebra & Functions

- Polynomial, exponential, logarithmic & trigonometric functions (advanced study)
- Complex numbers and geometric interpretation
- Systems of equations; matrices and determinants
- Sequences, series, and recurrence relations
- Newton–Raphson method for solving equations
- Modelling with real functions

2. Differential & Integral Methods

- Limits and continuity (advanced problems)
- Derivatives of extended function families
- Curve study: extrema, optimisation, and related rates
- Definite & indefinite integrals; area and volume calculations
- Introductory first-order differential equations
- Euler method for numerical solutions of differential equations

3. Mechanics & Energy

- Motion in 1D, 2D, and 3D; vectors, kinematics, and dynamics
- Newtonian dynamics with complex force systems
- Work–energy theorem; mechanical energy conservation
- Momentum, impulse, multi-object interactions
- Oscillations, resonance, and simple harmonic motion
- Thermodynamics: heat, temperature, internal energy, energy transfer, basic laws

4. Fields, Waves & Modern Physics

- Electric and magnetic fields: superposition, potentials, flux
- Circuit analysis including Kirchhoff's laws
- Wave phenomena: interference, diffraction, resonance
- Light as wave and particle (introductory models)
- Introductory elements of modern physics for applications

Exam Format in the Swiss Matura:

Written exam — 3 hours

- Multi-step problems combining mathematics and physics
- Modelling of real systems; advanced calculations

Oral component

- Explanation of a concept, derivation, or problem
- Evaluation of clarity, coherence, and depth of understanding



Biology–Chemistry (OS)

Specific Option — Swiss Matura

Curriculum Content:

1. Molecular Biology & Biochemistry

- Structure and function of biomolecules
- Enzyme kinetics and regulation
- Metabolism: glycolysis, respiration, photosynthesis (expanded)
- DNA replication, transcription, translation (mechanistic understanding)
- Genetic regulation and biotechnology applications

2. Organic Chemistry Models

- Structure, nomenclature, and properties of major organic families
- Isomerism, stereochemistry (qualitative)
- Reaction mechanisms: substitution, addition, elimination, oxidation–reduction
- Polymerisation and biomolecule-related chemistry
- Spectroscopy basics and structural interpretation (qualitative)

3. Human Physiology & Cellular Processes

- Nervous, endocrine, and immune regulation (advanced mechanisms)
- Cardiovascular, respiratory, and renal physiology
- Cellular signalling & membrane dynamics
- Homeostasis and regulatory feedback systems
- Applications to health, disease, and biotechnology

4. Experimental Methods & Data Analysis

- Laboratory techniques: titration, chromatography, microscopy, electrophoresis, and related OS-level methods
- Experimental design, variables, sources of error
- Quantitative analysis of biological and chemical data
 - Interpretation of graphs, kinetics curves, and concentration models
- Safety procedures and practices

Exam Format in the Swiss Matura:

Written exam — 3 hours

- Multi-step problems integrating biology and chemistry
- Quantitative analysis and modelling of biological/chemical systems

Oral component

- Explanation of a concept, pathway, or reaction mechanism
- Assessment of clarity, precision, and depth of scientific understanding



Arts (OS)

Specific Option — Swiss Matura

Curriculum Content:

1. Artistic Practice & Techniques

- Advanced drawing, painting, and mixed-media methods
- Exploration of materials (traditional, experimental, digital)
- Development of personal visual language
- Experimentation, iteration, and creative risk-taking

2. Composition, Space & Visual Construction

- Complex composition principles (balance, rhythm, contrast)
- Spatial organisation: perspective, volume, depth
- Visual storytelling and narrative structures
- Integration of colour theory and symbolic elements

3. Art History & Cultural Contexts

- Major artistic movements and their characteristics
- Study of influential artists and works across periods
- Social, historical, and cultural functions of art
- Comparative analysis of styles, themes, and interpretations

4. Critical Analysis & Artistic Reflection

- Reading and interpreting visual works
- Formal, thematic, and conceptual analysis
- Self-evaluation: intentions, choices, and outcomes
- Art in contemporary culture, media, and society
- Documentation of artistic process and methodology (OS requirement)

Exam Format in the Swiss Matura:

Written / Practical exam

- Creation of an artwork following constraints
- Accompanying commentary explaining choices, process, and interpretation

Oral component

- Presentation and discussion of personal production or analysed artwork
- Evaluation of artistic vocabulary, clarity, and conceptual understanding
- Analysis of selected artworks or visual documents



Economics–Law (OS)

Specific Option — Swiss Matura

Curriculum Content:

1. Microeconomics

- Markets, supply and demand, elasticity
- Consumer and producer behaviour
- Competition, monopoly, and market regulation
- Price formation and resource allocation

2. Macroeconomics & Public Policy

- GDP, inflation, unemployment
- Monetary and fiscal policy
- International trade and exchange rates
- Economic growth, development, structural change, sustainability

3. Law & Legal Frameworks

- Foundations of public and private law
- Rights, duties, and legal responsibility
- Legal reasoning, interpretation of norms, and hierarchy of laws
 - Contracts: formation, validity, obligations
- Civil liability, property, and consumer protection
- Judicial procedures and main legal institutions

4. Society, Institutions & Decision-Making

- Political institutions and governance
- Role of the state in the economy
- Social issues: inequality, welfare, labour market
- Ethical dimensions of economic and legal choices
- Individual and collective decision-making processes

Exam Format in the Swiss Matura:

Written exam — 3 hours

- Applied problem-solving using economic or legal cases
- Structured explanations linking economic or legal concepts to real cases

Oral component

- Explanation of a concept or case
- Evaluation of clarity, reasoning, and accuracy



Russian (OS)

Specific Option — Swiss Matura

Curriculum Content:

1. Reading & Text Interpretation

- Work with authentic literary and non-fiction texts in Russian
- Understanding of main ideas and overall meaning
- Identification of arguments and the author's viewpoint
- Recognition of key stylistic features

2. Literature & Cultural Perspectives

- Familiarisation with selected texts from Russian literature and culture
- Consideration of historical and social contexts
- Cultural and intercultural perspectives
- Reading and discussion of complete literary works used as the basis for the oral exam.
- Study of at least four complete works by different authors, covering multiple genres and historical periods (approx. 500 pages total)

3. Writing & Communication

- Production of argumentative, analytical, and reflective texts in Russian
- Clear structuring of written work (introduction, development, conclusion)
- Adaptation of language to the task and intended audience

4. Language Competence & Grammar

- Systematic work on grammar and syntax
- Expansion and precise use of vocabulary
- Accuracy and correctness in written and oral expression

Exam Format in the Swiss Matura:

Written exam — 3 hours

- Text analysis and/or an argumentative written task
- Assessment of comprehension, interpretation, structure, and written expression

Oral component

- Analysis of a text or theme
- Assessment of clarity, argumentation, linguistic accuracy, and cultural awareness



Mathematics (OC)

Complementary Option — Swiss Matura

Curriculum Content:

1. Algebra & Structures

- Complex numbers and algebraic manipulation
- Matrices, determinants, and systems of equations
- Sequences, series, and recurrence relations (directives include recurrence relations)
- Introduction to logic, reasoning, and proof techniques

2. Functions & Modelling

- Polynomial, exponential, logarithmic, and trigonometric models
- Piecewise and parameterised functions
- Transformations, inverses, and composition
- Applications to real-world modelling (strong emphasis from directives)

3. Calculus & Analysis

- Derivatives and integrals of extended function families
- Optimisation and analysis of function behaviour
- Differential equations (first-order qualitative models)
- Numerical approaches: approximations & iterative methods (Euler-type approximations appear in directives)

4. Probability & Statistics

- Combinatorics and counting principles
- Random variables and probability distributions (binomial, normal)
- Expectation, variance, and data interpretation
- Statistical reasoning and modelling

Exam Format in the Swiss Matura:

Oral Exam only:

- Explanation of a method, theorem, modelling approach, or solution
- Demonstration of reasoning and ability to justify each step
- Assessment of clarity, precision, and mathematical rigour



Geography (OC)

Complementary Option — Swiss Matura

Curriculum Content:

1. Physical Systems & Risks

- Climate systems, atmospheric circulation, climate change
- Hydrology, river systems, glaciers, coastal dynamics
- Natural hazards: earthquakes, floods, droughts
- Environmental vulnerability and risk management

2. Human Geography & Development

- Demographic transitions, migration, and urbanisation
- Economic development, inequalities, globalisation
- Rural and urban planning
- Geopolitical dynamics and territorial conflicts

3. Resources & Sustainability

- Water, soil, energy, and mineral resources
- Land-use conflicts and environmental impacts
- Sustainable development strategies
 - Food security, agriculture, and ecological limits

4. Probability & Statistics

- Advanced cartography and thematic mapping
- Remote sensing and satellite imagery (conceptual)
- Statistical and spatial analysis
- Critical evaluation of geographic information (documents, maps, media)

Exam Format in the Swiss Matura:

Oral Exam only:

- Document-based analysis or explanation of a geographic concept
- Interpretation of maps, graphs, or spatial documents
- Evaluation of clarity, accuracy, and analytical depth



Philosophy (OC)

Complementary Option — Swiss Matura

Curriculum Content:

1. Knowledge & Reality

- Origins and limits of knowledge
- Perception, reason, and scientific method
- Truth, objectivity, and interpretation
- Debates on reality, consciousness, and personal identity

2. Ethics & Moral Reasoning

- Foundations of moral judgment
- Duty, happiness, virtue, and responsibility
- Freedom, determinism, and moral agency
- Ethical issues in contemporary society

3. Politics & Society

- State, law, and political legitimacy
- Justice, equality, and rights
- Democracy, power, and social contract theories
- Individual vs collective interests

4. Argumentation & Text Analysis

- Reading and interpreting philosophical texts
- Identifying theses, arguments, and presuppositions
- Building structured arguments and counterarguments
- Conceptual clarification and precision

Exam Format in the Swiss Matura:

Oral Exam only:

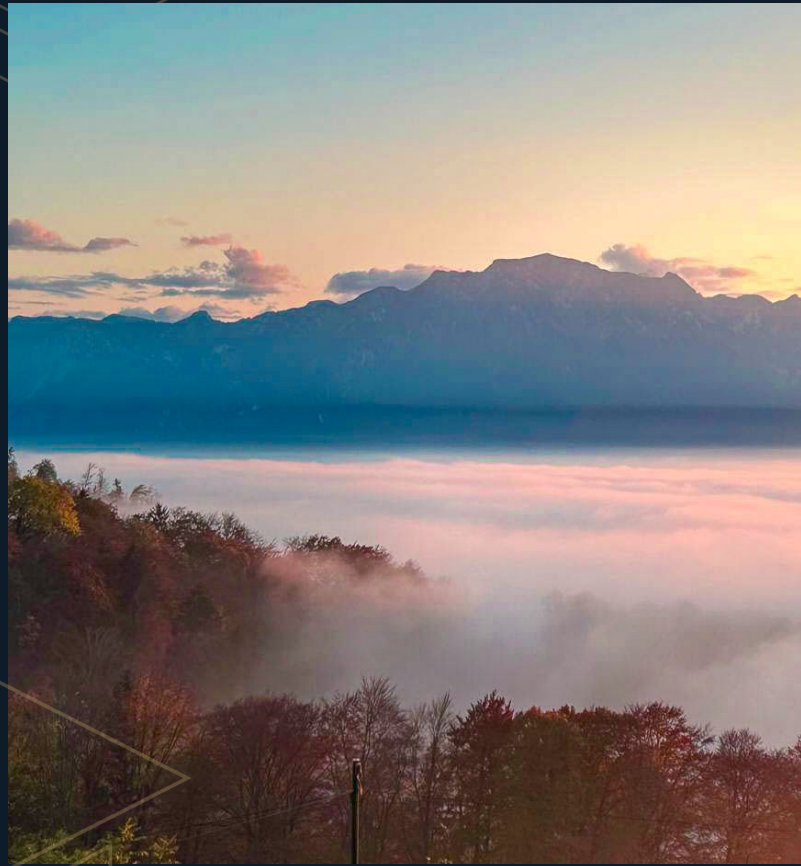
- Commentary and analysis of a philosophical text or theme
- Evaluation of clarity, rigor, conceptual precision, and argumentation











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