

CANADIAN ARTIFICIAL INTELLIGENCE COMPETITION FOUNDATION

2027 Provisional Assessment Framework

A concise draft defining the knowledge domains, stage progression, scoring principles and technical expectations for the proposed Canadian national AI selection.

STATUS

Draft for consultation. The final framework will follow the final IOAI 2027 syllabus and regulations.

Purpose

This framework gives students, families, reviewers and the assessment committee a clear view of what the selection is intended to assess. It is deliberately shorter than a detailed teaching curriculum and does not prescribe a commercial preparation program.

Core commitments

- One competition division for all eligible participants; no separate age or grade divisions.
- Advancement determined by official assessment scores under criteria published in advance.
- Written, coding and applied AI/ML tasks aligned with the final IOAI 2027 syllabus.
- Free sample materials and technical guidance published before the first stage.
- No portfolio, paid training history or school affiliation used as a selection factor.

1. Three-stage assessment structure

The stages increase in depth and practical complexity. Exact dates, duration, task counts, score weights and advancement thresholds will be confirmed before registration.

STAGE	FORMAT	PRIMARY PURPOSE	INDICATIVE TASKS
1 Canada Open Qualifier	Online; nationwide	Identify foundational readiness across a broad applicant pool.	Conceptual reasoning, mathematics for AI, code reading, short Python tasks and introductory data/ML questions.
2 National Semifinal	Online; identity verified and proctored	Assess independent problem solving and practical implementation.	Data preparation, model selection, evaluation, debugging and a structured applied coding task.
3 Team Canada Final	In person; Toronto	Select up to four team members and ranked reserves by demonstrated performance.	Written reasoning plus practical coding/model-development tasks using unseen problems or datasets.

Selection basis

- Scores from the official tasks are the basis for advancement and final team selection.
- Stage-specific rubrics, weights, thresholds and tie-breaking rules will be published before testing.
- Only valid results from participants who satisfy eligibility and integrity requirements will be ranked.
- Provisional results will be followed by a documented review or appeal window before final publication.

2. Knowledge and skill domains

The following domains define the intended breadth of assessment. They are not fixed percentage weights. Earlier stages emphasize foundations; later stages place greater emphasis on integration, implementation and analysis.

A. Python and computational foundations	Core Python syntax and control flow; functions and modules; strings, lists, dictionaries and tuples; reading, completing and debugging code; basic searching, sorting and computational reasoning.
B. Mathematics and data foundations	Algebra and functions; vectors and matrices at an introductory level; probability and descriptive statistics; distributions, distance and similarity; interpretation of tables, charts and experimental results.
C. Machine-learning foundations	Training, validation and test data; supervised and unsupervised learning; regression, classification and clustering; underfitting, overfitting and regularization; feature selection and model comparison.
D. Model evaluation	Accuracy, precision, recall, F1 score and confusion matrices; cross-validation; selecting an appropriate metric; identifying leakage, bias and unreliable conclusions.
E. Neural networks and modern AI	Perceptrons and multilayer neural networks; forward propagation, loss functions, gradient-based optimization and backpropagation; introductory CNN and attention/Transformer concepts where appropriate to the stage.
F. Applied AI and data workflows	Data loading and cleaning; missing values; exploratory analysis and visualization; feature engineering; reproducible experiments; training, tuning and evaluating models on structured or unstructured data.
G. Responsible AI and scientific practice	Data privacy, bias, fairness and responsible use; documenting assumptions; reproducibility; interpreting model limitations; academic integrity and compliance with permitted-tool rules.

3. Practical environment and scoring

Provisional technical environment

- Python will be the primary programming language.
- Likely core libraries include NumPy, pandas, Matplotlib and scikit-learn; PyTorch may be used in advanced tasks.
- The approved Python version, libraries, computing environment and documentation policy will be published before each stage.
- Whether generative-AI tools are permitted, restricted or prohibited will be stated explicitly for each stage.
- Tasks will be designed so that access to paid software, paid datasets or paid training is not required.

Scoring principles

TASK TYPE	POSSIBLE SCORING EVIDENCE
Written or short-answer	Correctness, reasoning and clear interpretation of AI/ML concepts or results.
Coding	Correct execution, task completion, robustness and compliance with the stated input/output requirements.
Applied modelling	Performance on disclosed and/or hidden evaluation data using a task-appropriate metric.
Analysis and explanation	Sound method selection, error analysis, reproducibility and recognition of limitations.

4. Publication and preparation

- Before registration: final eligibility, fee/waiver policy, confirmed schedule and assessment overview.
- Before each stage: format, duration, scoring rubric, advancement rule, permitted tools and technical instructions.
- Before the qualifier: free topic guidance, sample questions, representative coding tasks and environment setup guidance.
- After completion: provisional results, appeal process, final results and an archived public summary.

REFERENCE BASIS

This draft was informed by the IOAI Regulations and syllabus direction, the NOAI 2027 academic outline supplied for review, and the publicly described CAIO qualifier format. It is an independent Canadian draft and does not reproduce another organizer's competition structure.