# **Pre-Coding Essentials (Component: CONTRIBUTING.md, Version/FormulaID: VM-ENGINE v0) — 11/89**

## **1) Goal & Success**

Goal: Document how to propose changes **without breaking specs, determinism, or offline policy**; make reviews mechanical.

Success: Every change references Docs 1–7 / Annex A–B, passes hooks/tests, and keeps canonical artifacts reproducible.

## **2) Scope**

In scope: workflow, commit/PR conventions, formatting/linting, tests/fixtures, schema/spec change process, Formula ID policy.

Out of scope: legal/security policy (lives in SECURITY.md), release packaging.

## **3) Inputs → Outputs**

Inputs: Proposed code/spec/schema changes, Annex B fixtures, pre-commit hooks, vm\_cli.

Outputs: Reviewed commits/PRs that pass format/lint/tests, update fixtures/hashes when warranted, and document spec alignment.

## **4) Entities/Tables (minimal)**

## **5) Variables (process toggles)**

## **6) Functions (signatures only)**

(Doc file; no code functions.)

## **7) Algorithm Outline (document sections to include)**

**Principles (spec-first).**

Ultimate references: **Doc 1–7 + Annex A/B**. If code conflicts, **fix code** and update sheets; if spec needs evolution, open an ADR and bump Formula ID rules as required.

**Prereqs.**

Rust (pinned via rust-toolchain.toml), cargo, pre-commit hooks enabled, ability to run **offline**.

**Branch & commit style.**

Short topic branches; **Conventional Commits** (feat:, fix:, docs:, test:, refactor:).

Include spec refs (e.g., Doc4A §2.2) and test IDs (VM-TST-001) in the body.

**Formatting & lint.**

cargo fmt -- --check, cargo clippy -D warnings.

LF-only, UTF-8, sorted JSON keys; follow .editorconfig, .gitattributes.

**Tests you must run locally.**

cargo test --locked --workspace.

Minimal fixtures (Annex B Part 0/1): run twice with same --rng-seed → identical RES:/RUN: IDs.

No network at runtime; builds should succeed with CARGO\_NET\_OFFLINE=1 once vendored/fetched.

**Schemas & fixtures changes.**

**Never** change fixture semantics to “make a test pass.” If a spec bug: open issue + ADR candidate.

When schema shape changes, update: schema file → loader/validator → fixtures → tests → report mapping.

**Algorithm/variable changes.**

If it **alters outcomes**, it is **normative** → it must be reflected in **Annex A** (variable/constant) and may **change Formula ID**.

Add/modify VM-VAR only via PR that updates Doc 2 and Annex A; include migration notes.

**Tie-breaks, rounding, determinism.**

Deterministic ties by Option.order\_index unless tie\_policy=random (seeded).

Integer/rational math; **round half to even** only at defined comparison points.

Canonical JSON: UTF-8, LF, sorted keys; UTC timestamps.

**Reporting.**

One-decimal percentages; mandatory “approval rate” sentence for approval ballots; section order fixed (Doc 7A).

**When to bump versions.**

Engine version: any non-behavioral refactor that changes binary/API.

**Formula ID**: any normative change (variables, constants, algorithmic steps). Include regenerated FID manifest in PR.

Update CHANGELOG.md with “Spec compliance” and “Behavioral changes” entries.

## **8) State Flow (author → review → merge)**

Author runs hooks/tests offline → opens PR referencing spec sections and tests → reviewer checks spec alignment & determinism → CI mirrors local checks → merge if clean.

## **9) Determinism & Numeric Rules (to restate in doc)**

Same inputs + same seed ⇒ byte-identical outputs (Result, RunRecord).

No OS RNG/time in algorithms; no floats for comparisons; presentation rounding in report only.

## **10) Edge Cases & Failure Policy**

Missing RNG seed while tie\_policy=random ⇒ **reject PR** or add validation.

WTA with magnitude≠1 ⇒ validation must fail; add/keep tests.

CRLF introduced or unsorted JSON ⇒ hooks must block; fix before review.

## **11) Test Checklist (must pass before PR)**

pre-commit (fast) passes on staged files.

pre-push (clippy/tests/determinism smoke) passes.

Run Annex B Part 1: VM-TST-001/002/003 winners/labels match expected.

Two identical runs (same seed) produce identical RES:/RUN: IDs.

**Doc content hint:** keep CONTRIBUTING.md practical (≤ ~200 lines). Link out to Docs 1–7, Annex A/B, and any ADR directory for deeper policy changes.