Ruby Programming Language – Complete Detailed Notes (2026)

Introduction:
Ruby is a dynamic, object-oriented programming language, reaching version 4.0 in December 2025, introducing major inte

Key Features in Ruby 4.0:
- ZJIT: New next-gen JIT compiler offering higher long-term performance. (Mike Chilson, Ruby-lang.org)
- Ruby Box: Experimental isolated namespaces for parallel versions and safer monkey patching. (Mike Chilson, SSOJet)
- Set promoted to core class; improved Net::HTTP behavior. (Mike Chilson)
- Cleaner backtraces and faster GC & class instantiation. (Mike Chilson)

Concurrency & Ractors:
- Redesigned Ractor API with Ractor::Port improving communication. (Ruby-lang.org, Saeloun Blog)
- Ractor.shareable_proc & improved parallel execution. (codeminer42)

Language Improvements:
- Logical operators may start new lines for better readability. (Ruby-lang.org)
- Kernel#inspect now customizable. (Mike Chilson)
- nil no longer implicitly converts in some contexts. (Ruby-lang.org)

Performance Innovations:
- ZJIT aims for eventual improvement over YJIT; uses SSA-based IR. (SSOJet)
- Massive performance refinements seen in Ruby 3.x leading into 4.0. (Heise Online)

Ecosystem Updates:
- Ruby 4.0 works with modern package systems; improved dependency management. (SSOJet)
- Type system enhancements: RBS, Steep, gradual typing vision. (Heise Online)
- Prism becoming the standard Ruby parser. (Heise Online)

Use Cases:
- High-load production systems such as Shopify using Ruby at scale. (Heise Online)
- Web apps, scripting, automation, APIs, backend services.