

LLM Engineering Diploma — Syllabus

Certified LLM Engineer (CLLME) · Global Anti-Crime System (GACS) Academy · gacs.app

Program Overview

A 12-module professional diploma teaching engineers to design, train, fine-tune, evaluate, and deploy transformer-based large language models — including how to harden them against the prompt-injection and agent-abuse patterns documented in the GACS fraud registry. Tuition USD \$499. Lifetime access. Final exam (50 questions) and a graded capstone are required for the diploma.

Learning Outcomes

- Design and implement a transformer architecture from scratch (tokenizer, embeddings, multi-head attention, training loop).
- Fine-tune open-weight LLMs using LoRA, QLoRA, and instruction-tuning on consumer GPUs.
- Evaluate model quality with perplexity, task benchmarks, and safety / red-team tests appropriate for production.
- Deploy quantized models behind low-latency inference servers with caching, batching, and cost controls.
- Identify and harden against the most common LLM agent exploits (prompt injection, tool abuse, data exfiltration).
- Communicate model behaviour, limits, and risk to non-technical stakeholders in writing.

Modules (≈ 60 study hours)

#	Module	Topics
01	Foundations of LLMs	Transformer basics, scaling laws, architecture.
02	Tokenization & Embeddings	BPE, WordPiece, positional encodings, vector spaces.
03	Attention & Transformers	Self-attention, multi-head attention, QKV math.
04	Training & Optimization	Loss functions, batching, GPUs, distributed training.
05	Fine-Tuning & RLHF	LoRA, QLoRA, instruction tuning, reward models.
06	Evaluation & Deployment	Perplexity, safety tests, quantization, serving.
07	Scaling & Production	Sharding, ZeRO, DeepSpeed, caching, cost control.
08	Agent Architectures	Tool use, planners, memory, multi-step reasoning.
09	Prompt Injection & Defence	Real exploit patterns from the GACS fraud registry.
10	Safety, Bias & Red Teaming	Eval harnesses, jailbreak suites, content policies.
11	Cost, Latency & Observability	Token economics, telemetry, regression tests.
12	Capstone Engineering	Spec → train → evaluate → deploy → write up.

Capstone Grading Rubric (Pass mark 70%)

Criterion	Weight	What we look for
Architecture correctness	20%	Transformer blocks, attention math, tokenizer behave as specified.
Training pipeline	20%	Reproducible data prep, batching, optimizer schedule, loss curves.
Evaluation rigor	15%	Quantitative metrics + qualitative samples + at least one safety test.
Deployment readiness	15%	Quantization, inference script, latency / cost notes, error handling.
Security & robustness	15%	Documented threat model and mitigations for prompt injection / abuse.
Technical report	15%	Clear writing, honest limitations, reproducibility instructions.

Instructor

Nikk Delibasic — Founder, GACS. 30 years engineering experience leading real-world teams of 250+; 10 years as project manager on \$1.5 billion projects. Retired early to build GACS as a free, ad-free fraud-protection platform; tuition from this diploma keeps the public registry running.

Accreditation & Partnerships

Accreditation applications in progress with international continuing-professional-development bodies. Verifiable digital badge integration planned via Credly / Accredible. Partnership inquiries welcome at partners@gacs.app.

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