AI ENGINEER CAREER TRANSITION PLAN

From Payments IT Manager to £100k-130k AI Engineer

November 2025 → August 2026 | 34 Weeks | 11-13 hrs/week

START	TARGET	DURATION	COMMITMENT
Nov 27, 2025	£115-130k AI Engineer	34 weeks (8.5 months)	11-13 hrs/week
Week 1-2 Complete ✓	Fintech Focus	374-442 total hours	Sustainable pace

PORTFOLIO	CERTIFICATIONS	DIFFERENTIATION
Phase 1: RAG System	AWS AI Practitioner ✓	Java + Python Architecture
Phase 2: AI Agents	AWS GenAI Pro (Mandatory)	12 Years Fintech Domain
Capstone: Hybrid Java/Python	AWS ML Associate (Optional)	Production Engineering Focus

MONTH 1: FOUNDATIONS + PHASE 1 START (Weeks 1-4)

Math, Python, Phase 1 Infrastructure

Week 1: ML Foundations ✓ [COMPLETED]

• Mon-Thu: Vectors, matrices, probability, statistics
• Fri: Python setup | Sat (5h): NumPy + Scikit-learn + Classical ML overview
• Sun: Pandas & data analysis
→ **Math + Python + ML basics**

Week 2: APIs & More Math ✓ [COMPLETING BY NOV 30]

• Mon-Thu: Calculus, gradient descent, loss functions
• Fri: REST APIs, Python requests | Sat (4h): FastAPI basics
• Sun (3h): Transaction Stats API project
→ **API development skills**

Week 3: Phase 1 Week 1 - Infrastructure (Dec 1-7)

• Mon: Docker basics | Tue: FastAPI setup | Wed: PostgreSQL + OpenSearch
• Thu: Airflow basics | Fri: Integration testing
• Sat (4h): Complete Docker Compose stack | Sun (3h): Health checks & testing
→ **Complete infrastructure with all services running**

Week 4: Phase 1 Week 2 - Data Pipeline (Dec 8-14)

• Mon: arXiv API | Tue: PDF download logic | Wed: GROBID parsing
• Thu: Docling fallback | Fri: Airflow DAG setup
• Sat (4h): Automated daily pipeline | Sun (3h): Testing & monitoring
→ **Automated paper ingestion from arXiv**

MONTH 2: LLM ESSENTIALS + PHASE 1 CORE (Weeks 5-8)

LLM APIs, Prompt Engineering, Search Systems

Week 5: LLM Fundamentals (Dec 15-21)

• Mon (1.5h): LLM basics (Karpathy) | Tue: Transformer architecture overview
• Wed: Embeddings deep-dive | Thu: OpenAI API basics | Fri (1.5h): Tokenization + costs
• Sat (3h): API experiments | Sun (3h): Parameter testing
→ **Understanding LLMs, APIs, and embeddings**

Week 6: Prompt Engineering (Dec 22-28) [Christmas Week - Theory]

• Mon: Prompt basics | Tue: Few-shot learning | Wed: Chain-of-thought
• Thu: Role prompting | Fri: Prompt patterns
• Sat (3h): Fintech prompt library | Sun (3h): Testing & documentation
→ **Master prompt engineering + 10+ fintech prompts**

Week 7: Phase 1 Week 3 - BM25 Search (Dec 29 - Jan 4)

• Mon: BM25 algorithm | Tue: OpenSearch implementation | Wed: Filtering logic
• Thu: Relevance scoring | Fri: Query processing
• Sat (3h): Production BM25 search | Sun (3h): Optimization & testing
→ **Keyword search with filtering and ranking**

Week 8: Phase 1 Week 4 - Hybrid Search (Jan 5-11)

• Mon: Vector similarity | Tue: Vector DB comparison (Pinecone/ChromaDB/Weaviate)
• Wed: ChromaDB setup | Thu: Chunking strategies | Fri: Hybrid architecture
• Sat (4h): Implement hybrid search | Sun (3h): Benchmark & evaluate
→ **Semantic + keyword hybrid search system**

MONTH 3: PHASE 1 COMPLETE + ADVANCED RAG (Weeks 9-12)

RAG Pipeline, Observability, Advanced Patterns

Week 9: Phase 1 Week 5 - RAG Pipeline (Jan 12-18)

• Mon: RAG architecture | Tue: Local LLM (Ollama) setup | Wed: Prompt engineering for RAG
• Thu: LlamaIndex integration | Fri: Streaming responses
• Sat (4h): Complete RAG pipeline | Sun (3h): Gradio interface & testing
→ **End-to-end RAG with LLM and UI**

Week 10: Phase 1 Week 6 - Observability (Jan 19-25) [+2h]

• Mon: Langfuse setup | Tue: Tracing implementation | Wed: Metrics collection
• Thu: Redis caching | Fri: Performance optimization
• Sat (5h): Monitoring dashboard + SQL analytics queries [+2h ADDED]
• Sun (3h): Professional README + architecture diagram + metrics documentation
→ **Production monitoring + professional documentation [ENHANCED]**

Week 11: Advanced RAG Patterns (Jan 26 - Feb 1)

• Mon: RAG evaluation (RAGAS, nDCG) | Tue: Query expansion | Wed: HyDE pattern
• Thu: Re-ranking with cross-encoders | Fri: Context window optimization
• Sat (3h): Implement advanced patterns | Sun (3h): Evaluation & benchmarking
→ **Advanced RAG techniques + evaluation framework**

Week 12: FLEXIBLE BUFFER (Feb 2-8) [DECISION POINT]

• OPTION A: Phase 2 starts → Begin Phase 2 cohort
• OPTION B: Phase 2 delayed → Do Phase 1 Week 7 (Agentic RAG + Telegram bot)
• OPTION C: Ahead of schedule → Debugging practice (+3h): Break & fix Phase 1 system
• Use this week based on Phase 2 confirmed start date + your energy level
→ **Phase 1 Week 7 OR Phase 2 start OR Debugging practice (TBD)**

MONTH 4-5: PHASE 2 AGENTS COHORT (Weeks 13-19)

AI Agents, Tools, Orchestration, Evaluation

Week 13-14: Agent Foundations (Weeks 1-2 of Phase 2)

• Focus: ReAct patterns, tool calling, LangGraph basics
• Agent planning, error handling, state management
• Weekly cohort sessions + hands-on agent projects
→ **Working agents with tool integration**

Week 15-16: Multimodal & Structured Outputs (Weeks 3-4 of Phase 2)

• Focus: Vision models (GPT-4V), document understanding, OCR
• JSON mode, Pydantic schemas, output validation
• Weekly cohort sessions + multimodal projects
→ **Multimodal agents + structured outputs**

Week 17-18: Advanced Agents & Evaluation (Weeks 5-6 of Phase 2)

• Focus: Multi-agent systems, orchestration, memory
• Agent evaluation frameworks, LLM-as-judge
• Weekly cohort sessions + final Phase 2 project
→ **Production-grade agent systems**

Week 19: Phase 2 Buffer / Weeks 7-8 if 8-week cohort

• Complete Phase 2 projects and polish
• If Phase 2 is 6 weeks: Use for consolidation
• If Phase 2 is 8 weeks: Continue with final weeks
→ **Phase 2 complete with portfolio project**

MONTH 5-6: FINE-TUNING + PRODUCTION ENGINEERING (Weeks 20-26)

Transformers, LoRA, MLOps, Docker, Monitoring, Security

Week 20: Transformers + PyTorch (Compressed)

• Mon: Transformer architecture | Tue (2h): PyTorch tensors + autograd
• Wed: Multi-head attention | Thu (2h): Implement self-attention (Q,K,V)
• Fri (2h): Karpathy 'Build GPT' | Sat (3h): Build components | Sun: HuggingFace
→ **Transformer understanding + PyTorch basics**

Week 21: Fine-tuning Basics

• Mon: Fine-tuning vs RAG | Tue: LoRA & QLoRA | Wed: PEFT library
• Thu: Data preparation | Fri: Training setup
• Sat (3h): Fine-tune small model | Sun (3h): Evaluation & comparison
→ **First fine-tuned model**

Week 22: Advanced Fine-tuning & Deploy [+2h]

• Mon: Instruction tuning | Tue: RLHF & DPO intro | Wed: Hyperparameters
• Thu: Quantization | Fri: Model serving (vLLM, TGI)
• Sat (3h): Optimize model | Sun (5h): Deploy to AWS + error handling [+2h ADDED]
• Add: Retry logic, exponential backoff, rate limiting for production
→ **Optimized model deployed with production error handling [ENHANCED]**

Week 23: Containerization & Infrastructure

• Mon: Docker for ML | Tue: Docker Compose | Wed: AWS Bedrock & SageMaker
• Thu: IaC basics | Fri: CI/CD with GitHub Actions
• Sat (3h): Containerize RAG app | Sun (3h): Deploy to ECS
→ **Containerized production deployment**

Week 24: Monitoring OR AWS ML Cert [DECISION POINT - OPTIONAL]

• PATH A: LLM observability, metrics (latency/cost/tokens), tracing, logging, dashboard
• PATH B: AWS ML Associate cert prep + exam (15-20 hours)
• Choose based on: career goals, energy level, time available
→ **Full monitoring system OR AWS ML cert**

Week 25: Security & Guardrails

• Mon: Prompt injection attacks | Tue: PII detection & redaction
• Wed: Content moderation | Thu: OWASP Top 10 for LLMs | Fri: Implementation
• Sat (3h): Security testing | Sun (3h): Hardening & documentation
→ **Secured AI application**

Week 26: Cost Optimization & Performance

• Mon: Token optimization | Tue: Caching strategies | Wed: Model routing
• Thu: Batch processing | Fri: Cost monitoring
• Sat (3h): Implement optimizations | Sun (3h): Performance benchmarks
→ **30%+ cost reduction achieved**

MONTH 7: ADVANCED TECHNIQUES + CERTIFICATION (Weeks 27-30)

GraphRAG, Knowledge Graphs, Fintech Specialization, AWS GenAI Pro

Week 27: Advanced RAG (GraphRAG, CRAG, Self-RAG)

• Mon: Agentic RAG patterns | Tue: Corrective RAG (CRAG) | Wed: Self-RAG
• Thu: GraphRAG introduction | Fri: Adaptive retrieval
• Sat (4h): Implement advanced RAG | Sun (3h): Benchmark improvements
→ **State-of-art RAG techniques**

Week 28: Knowledge Graphs

• Mon: Neo4j basics | Tue: Entity extraction | Wed: Relationship mapping
• Thu: Graph querying (Cypher) | Fri: LLM + knowledge graphs
• Sat (4h): Build payment network graph | Sun (3h): Graph-based RAG
→ **Knowledge graph integrated system**

Week 29: Fintech Specialization [REALLOCATED]

• Mon: Fraud detection patterns | Tue: Compliance automation | Wed: Real-time systems
• Thu: Kafka integration | Fri: Event-driven ML
• Sat (3h): Real-time fraud scoring | Sun (3h): Explainability framework + audit logs
• Focus: Source citations, confidence scores, incident response, regulatory compliance
→ **Fintech AI patterns + explainability for compliance [ENHANCED]**

Week 30: AWS GENAI PROFESSIONAL CERT [MANDATORY]

• Mon: Bedrock fundamentals | Tue: Knowledge Bases (RAG) | Wed: Agents
• Thu: Responsible AI | Fri: Fine-tuning review
• Sat (4h): Practice exams | Sun: TAKE EXAM
→ **AWS Certified GenAI Professional (£15k-25k salary impact)**

MONTH 8-9: HYBRID CAPSTONE + JOB LAUNCH (Weeks 31-34)

Production Fraud Detection System (Java + Python) + Job Search

Week 31: Capstone Planning + Architecture Setup

• Mon (1.5h): System architecture design (Java backend + Python ML)
• Tue (1.5h): Tech stack decisions | Wed: Database schema | Thu: API contracts
• Fri (1h): UI/UX planning | Sat (4h): Infrastructure setup (2h Java + 2h Python)
• Sun (3h): Initial implementation (Spring Boot skeleton + FastAPI skeleton)
→ **Architecture designed + infrastructure ready**

Week 32: Core Development

• Mon (1.5h): Python RAG system | Tue (1.5h): LLM agent for fraud analysis
• Wed (1.5h): Java API gateway | Thu (1.5h): Kafka event processing (Java)
• Fri (1h): Integration layer | Sat (5h): Core features (3h Python + 2h Java)
• Sun (4h): Business logic + authentication
→ **Fraud detection system with Java/Python integration**

Week 33: Integration, Polish & Deploy

• Mon (1h): REST APIs between services | Tue (1h): Redis caching (Java side)
• Wed (1h): Message queues | Thu (1h): End-to-end testing | Fri (1h): UI polish
• Sat (4h): AWS deployment (2h) + Java integration testing (2h)
• Sun (3h): Performance optimization + documentation
→ **Production-ready hybrid system deployed on AWS**

Week 34: Portfolio & Job Launch

• Mon (1.5h): GitHub polish + README | Tue (1.5h): Blog post 1 (RAG journey)
• Wed (1.5h): Blog post 2 (Agents) | Thu (1.5h): Blog post 3 (Production ML)
• Fri (1h): LinkedIn optimization | Sat (4h): Resume + cover letter templates
• Sun (3h): 10-15 job applications to target companies
→ **Portfolio live + Applications sent + Job hunt active**

YOUR PATH TO £115-130K AI ENGINEER

Complete Plan Summary

COMPONENT	COVERAGE	CAREER IMPACT
Portfolio Projects	Phase 1 (RAG) Phase 2 (Agents) Capstone (Hybrid)	Gets interviews 3 major deployments GitHub portfolio
Certifications	AWS AI Practitioner ✓ AWS GenAI Pro (Mandatory) AWS ML (Optional)	£10-15k salary boost Credibility signal Cloud expertise
Differentiation	Java + Python 12 years fintech Production focus	£5-10k premium Senior positioning Rare skillset
Technical Depth	RAG (7 weeks) Agents (8 weeks) Production (4 weeks)	Interview ready 95%+ coverage Real expertise

KEY DECISION POINTS

WEEK	DECISION	OPTIONS
12	Phase 2 Start Timing	A: Phase 2 starts → Join cohort B: Phase 2 delayed → Do Phase 1 Week 7
24	Monitoring vs Cert	A: Build monitoring system (recommended) B: AWS ML Associate cert
31-34	Java Integration	MANDATORY: Hybrid architecture in capstone Adds 10-12 hours across 4 weeks

INVESTMENT & EXPECTED RETURNS

INVESTMENT	EXPECTED RETURNS
Time: 374-442 hours (11-13 hrs/week × 34 weeks) Money: £800-1,200 (courses + certs + AWS) Opportunity: 8.5 months learning	Salary: £20-30k increase (£100-110k → £115-130k) Speed: 2 months faster job search ROI: 25-35x return on investment Career: Senior AI Engineer positioning

TARGET COMPANIES & ROLES

Fintech: Stripe, Revolut, Monzo, Wise, Klarna | **Banking:** JP Morgan AI, Goldman Sachs, Barclays | **AI Companies:** Anthropic, AWS (Solutions Engineer), Enterprise AI teams | **Roles:** AI/ML Engineer, AI Solutions Engineer, Senior ML Engineer (GenAI focus)

SUCCESS FACTORS

✓ **Consistency:** 11-13 hrs/week, every week for 34 weeks | ✓ **Portfolio:** Deploy all 3 major projects (Phase 1, 2, Capstone) | ✓ **Certification:** AWS GenAI Professional is mandatory | ✓ **Networking:** Phase 2 cohort, LinkedIn, fintech communities | ✓ **Applications:** 10-15 quality applications Week 34, then continuous

EXECUTION GUIDELINES: TIER 1 + TIER 2 + TIER 3

TIER 1: QUALITY PRINCIPLES (Always Do)	✓ Write professional READMEs as you go, not rushed at end ✓ Track metrics from day 1 (simple spreadsheet)
TIER 2: STRATEGIC ADDITIONS (If Weeks 10-12)	(6-8 weeks total) Week 12: +3h debugging IF buffer week available <
TIER 3: OPTIONAL (Do IF Time Or After Main)	Learning Path): After 9 months (weeks 35-40):<b

TARGET: £115-130K AI ENGINEER | AUGUST 2026 | FINTECH-READY! ✓