BAFAI
BLOOM ACADEMY FOR AI

AI Research Curriculum

Industry-Relevant AI Training for Career Advancement

SCHOLARSHIPS AVAILABLE
T&C Applies

Course Objective

Prepare to understand, design, and conduct foundational AI research from literature review and experimental design to evaluation, reproducibility, and presenting original findings in a self paced style format.

Monthly Salary Expectation

Nigeria
₦450,000 – ₦1,200,000

Canada
$6,100 – $7,700 (CAD)
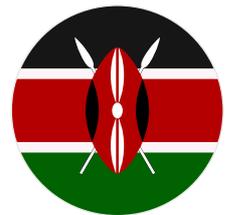
United States
$10,800 – $13,000

Denmark
DKK $6,000 – DKK $7,500

United Kingdom
£5,470 – £9,830

Kenya
$900 – $2,200

Learning Model

Course Mode
Online and
Project-based

Course Duration
12 weeks

Programme Level
Beginner to Intermediate

Certificate
Certificate of completion

Module 01

Introduction of AI Research

- What is research in AI?
- Types of AI research (theoretical, applied, experimental)
- Turning real-world problems into research questions
- Basics of hypothesis formulation
- Introduction to experimental thinking
- Understanding research ethics

Module 02

Introduction to major AI areas with practical orientation:

Machine Learning fundamentals
- Neural Networks basics
- Natural Language Processing fundamentals
- Computer Vision overview
- Reinforcement Learning basics
- Examples drawn from:

OpenAI

DeepMind
- Focus: understanding concepts – not frontier mathematics.

Module 03

Research Tools & Experimental Setup

- Python for research workflows
- Using notebooks for experimentation
- Introduction to:

PyTorch

TensorFlow

- Basic experiment tracking
- Version control fundamentals
- Reproducibility principles

Hands-on: Train and evaluate a simple ML model.

Module 04

Data Collection & Preparation

- What makes a good dataset?
- Public datasets and benchmarking
- Data cleaning basics
- Feature engineering fundamentals
- Train/test splits
- Avoiding data leakage

Hands-on: Prepare dataset and document preprocessing steps.

Module 05

Statistical Foundations for AI Research

- Descriptive vs inferential statistics
- Probability basics for ML
- Sampling & bias
- Statistical significance
- Confidence intervals
- Hypothesis testing basics
- Understanding p-values
- Correlation vs causation

Hands-on: Run statistical tests comparing two models..

Module 06

Model Evaluation & Metrics

- Accuracy, precision, recall, F1 score
- Regression metrics
- Confusion matrices
- Basic statistical thinking
- Overfitting vs underfitting
- Introduction to fairness and bias evaluation

Hands-on: Evaluate model performance using multiple metrics.

Module 07

Literature Review & Research Communication

- How to read AI papers effectively
- Understanding structure of research papers
- Writing a literature review
- Citation practices
- Introduction to peer review
- Creating research presentations
- Examples from:

NeurIPS

ICML

Hands-on: Critique one published AI paper.

Module 08

Reproducibility, Open Science & Research Engineering

- What makes research reproducible?
- Code organization standards
- Dataset versioning
- Experiment logging tools
- Documentation best practices
- Open-source research practices
- Creating research repositories
- Writing reproducibility checklists
- Hands-on: Reproduce a simple published experiment.

Module 09

Innovation & Identifying Research Gaps

- What makes research "novel"?
- Identifying gaps in existing literature
- Replication studies vs new contributions
- Translating research into practical innovation
- Responsible AI innovation

Activity: Propose an original but manageable research idea.

Capstone Research Development

- Learners must:
- Define a focused research question
- Conduct structured experiment
- Apply appropriate metrics
- Compare results with baseline
- Ensure reproducibility
- Document methodology clearly

Project Defence

Personal Project Presentations

Note:

- **All modules, project work, project defense, and grading work will be completed in a total of 12 weeks from the course start date.**

Certificate Sample

BAFAI
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CERTIFICATE OF COMPLETION
IN AI RESEARCH AND INNOVATION

THIS CERTIFICATE IS PROUDLY PRESENTED TO

Emeka Adediran Audu

Who has successfully completed the Agentic AI course comprising: Introduction of AI Research, Research Tools & Experimental Setup, Data Collection & Preparation, Statistical Foundations for AI Research, Literature Review and Research Communication

Dr. Lola Olukuewu
Certified Chief Artificial Intelligence Officer
Founder, BAFAI

Mrs. Tolu Akinjole
Head of Programs

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