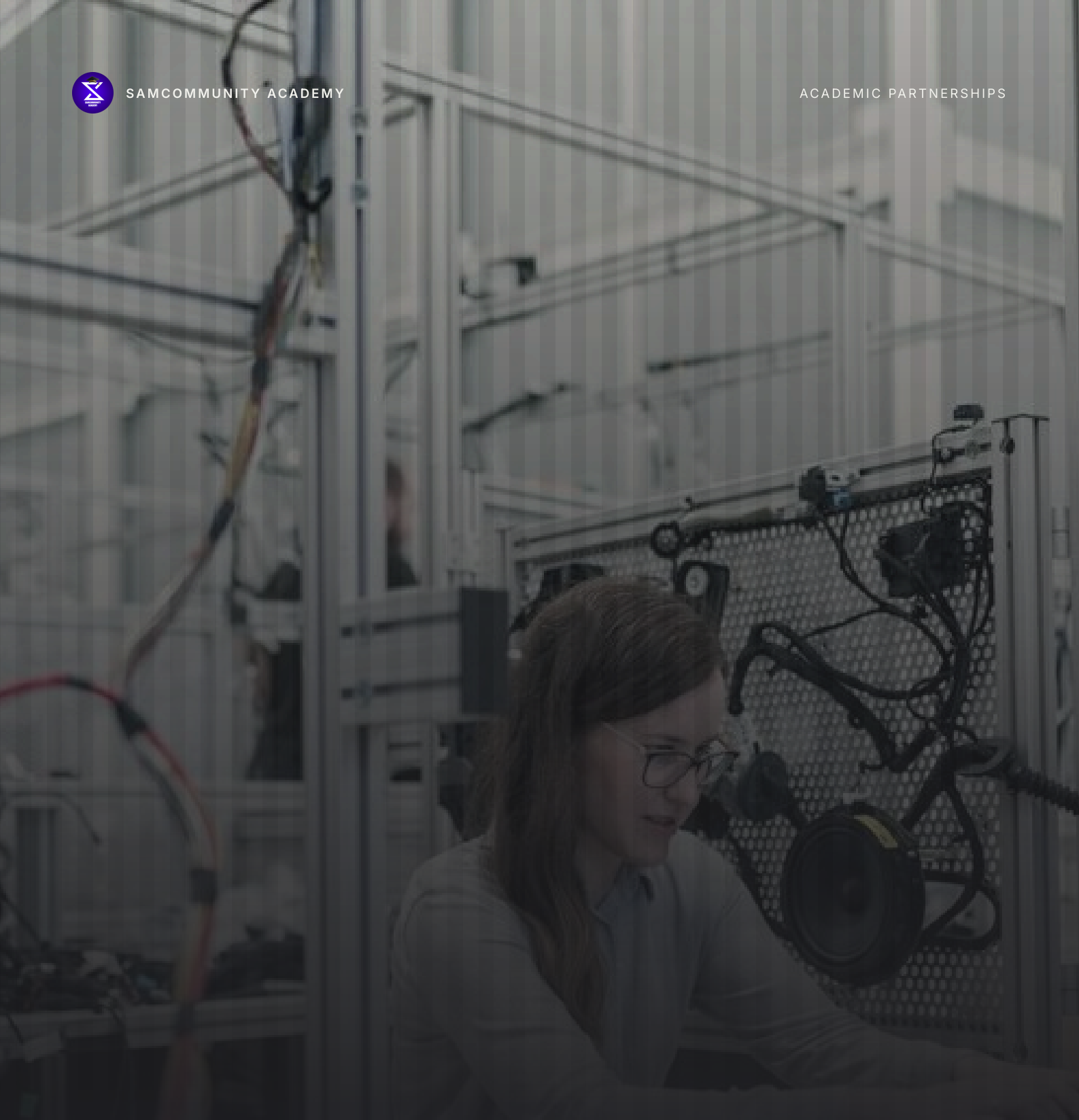


ACADEMIC PARTNERSHIP PROGRAMS · ADVANCED

AI Research & Innovation Program

Research that ships.

3 MONTHS · 5 MODULES

SAM-IITAI · 2026

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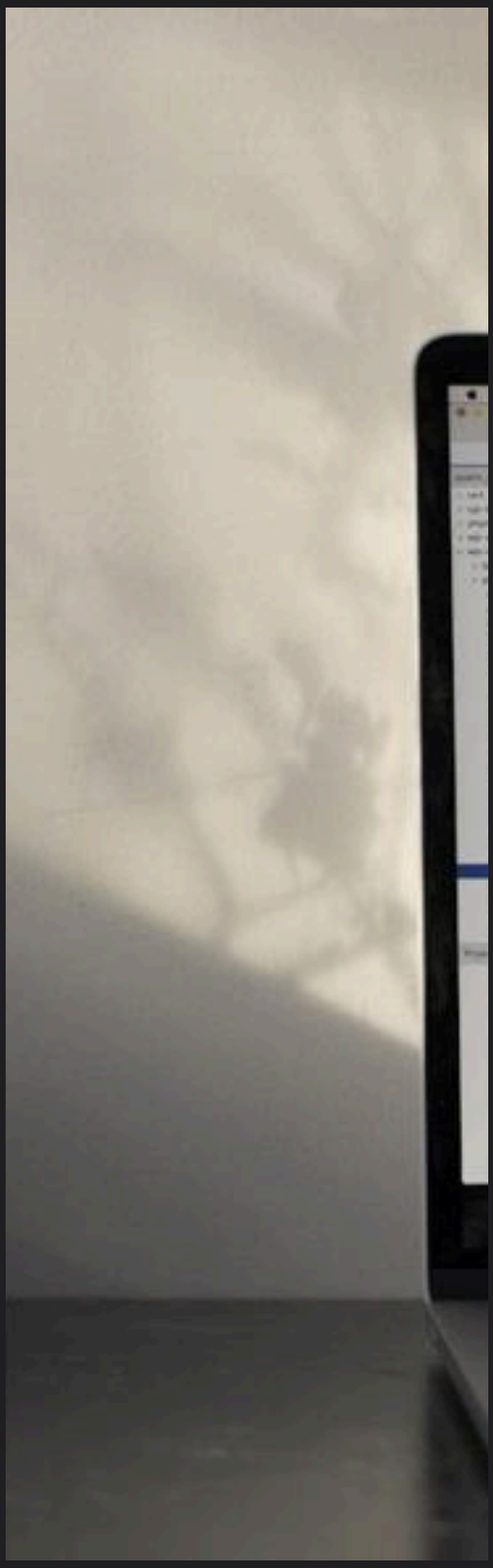
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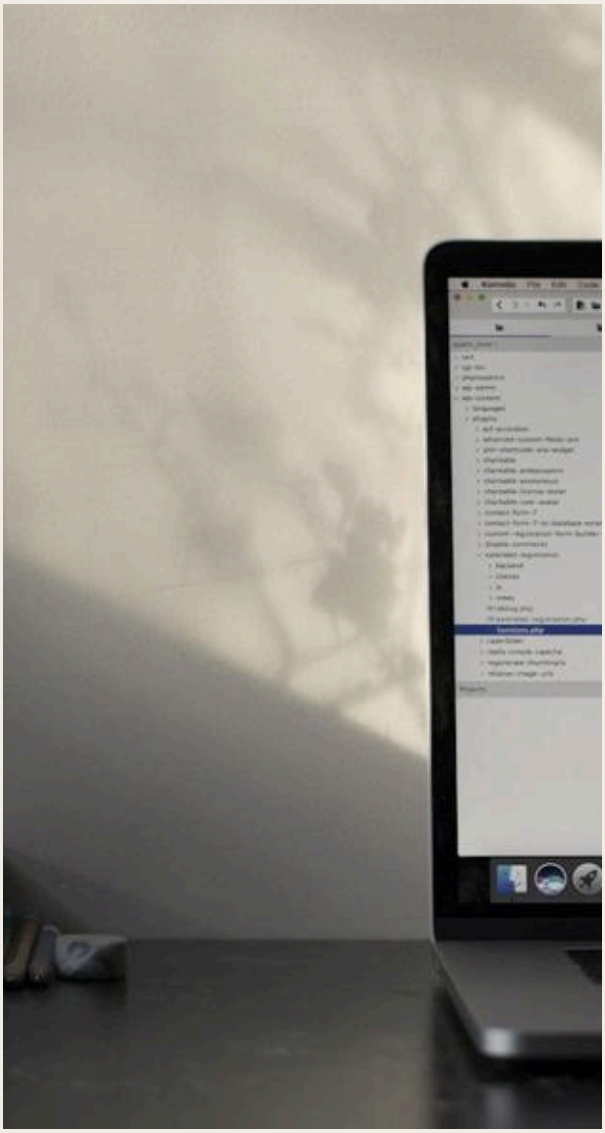


LEVEL	Advanced
DURATION	3 Months
MODULES	5
CERTIFICATE	SAM-IITAI

Why this program

Mentored applied AI research for top-tier students.

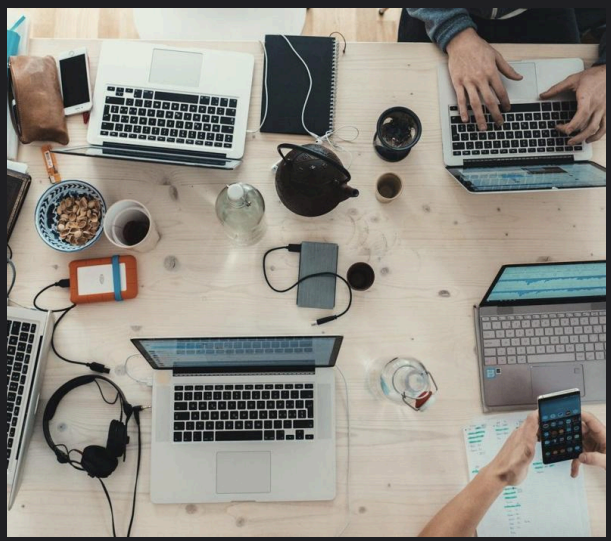
Applied AI moves fast, and the most valuable skills combine strong fundamentals with the discipline to run careful experiments and report them honestly. This mentored research program guides top students through framing an applied AI problem, building baselines, developing and evaluating models with PyTorch and Hugging Face, checking fairness and reproducibility, and presenting results to experts as a credible research outcome.



3
months of compact, practical sessions

5
focused modules, built around real work

3
projects plus a capstone presentation



Who this program is for



01

Vice-chancellors & deans

CoE, curriculum and accreditation support

02

Training & placement cells

Certification and placement readiness

03

Faculty

Faculty development programs

04

Top-tier students

Research internships, CTF academy, incubation

PREREQUISITES

- Strong Python programming skills
- Foundations in machine learning and linear algebra
- Prior experience with an ML framework

DESIGNED FOR

- AI research interns
- Machine learning engineers
- Applied research scientists
- NLP and computer vision engineers
- Graduate research candidates

What you'll be able to do.

01 Read AI research papers and frame focused research questions

02 Prepare datasets and build strong baselines in PyTorch

03 Fine-tune pretrained models using Hugging Face tools

04 Run ablation studies and rigorous evaluation with error analysis

05 Check models for bias, fairness and reproducibility issues

06 Write research reports and present results to expert reviewers

How the program works

Weeks 1–2: Problem Framing

Reading AI research papers, Identifying applied AI problems, Defining research questions, Dataset discovery on Hugging Face.

Weeks 3–5: Data and Baselines

Data cleaning and preprocessing, Exploratory data analysis, Building baselines in PyTorch, Choosing evaluation metrics.

Weeks 6–9: Model Development

Fine-tuning pretrained models, Hyperparameter tuning, Ablation studies, Efficient training techniques.

Weeks 10–11: Evaluation and Responsible AI

Robust evaluation design, Error analysis, Bias and fairness checks, Reproducibility practices.

01 · Weeks 1–2: Problem Framing

02 · Weeks 3–5: Data and Baselines

03 · Weeks 6–9: Model Development

04 · Weeks 10–11: Evaluation and Responsible AI

05 · Week 12: Reporting and Demo

★ Capstone · Applied AI Research Project



The curriculum

MODULES 01–03

01 Weeks 1–2: Problem Framing

Practical: Write a one-page research proposal with question, data and baseline plan

Hugging Face

- Reading AI research papers
- Identifying applied AI problems
- Defining research questions
- Dataset discovery on Hugging Face
- Baseline selection

02 Weeks 3–5: Data and Baselines

Practical: Train and log a baseline model with documented metrics and data splits

PyTorch

- Data cleaning and preprocessing
- Exploratory data analysis
- Building baselines in PyTorch
- Choosing evaluation metrics
- Experiment tracking

03 Weeks 6–9: Model Development

Practical: Fine-tune a pretrained model and run ablations against the baseline

- Fine-tuning pretrained models
- Hyperparameter tuning
- Ablation studies
- Efficient training techniques
- Mentor review cycles



Curriculum, continued

MODULES 04–05

04 Weeks 10–11: Evaluation and Responsible AI

Practical: Perform error analysis and fairness checks, then write a model card

- Robust evaluation design
- Error analysis
- Bias and fairness checks
- Reproducibility practices
- Model documentation

05 Week 12: Reporting and Demo

Practical: Present the research and live demo to a panel of expert reviewers

- Writing a research report
- Building a simple demo
- Presenting to experts
- Open-sourcing code responsibly
- Planning next steps



What you'll focus on.

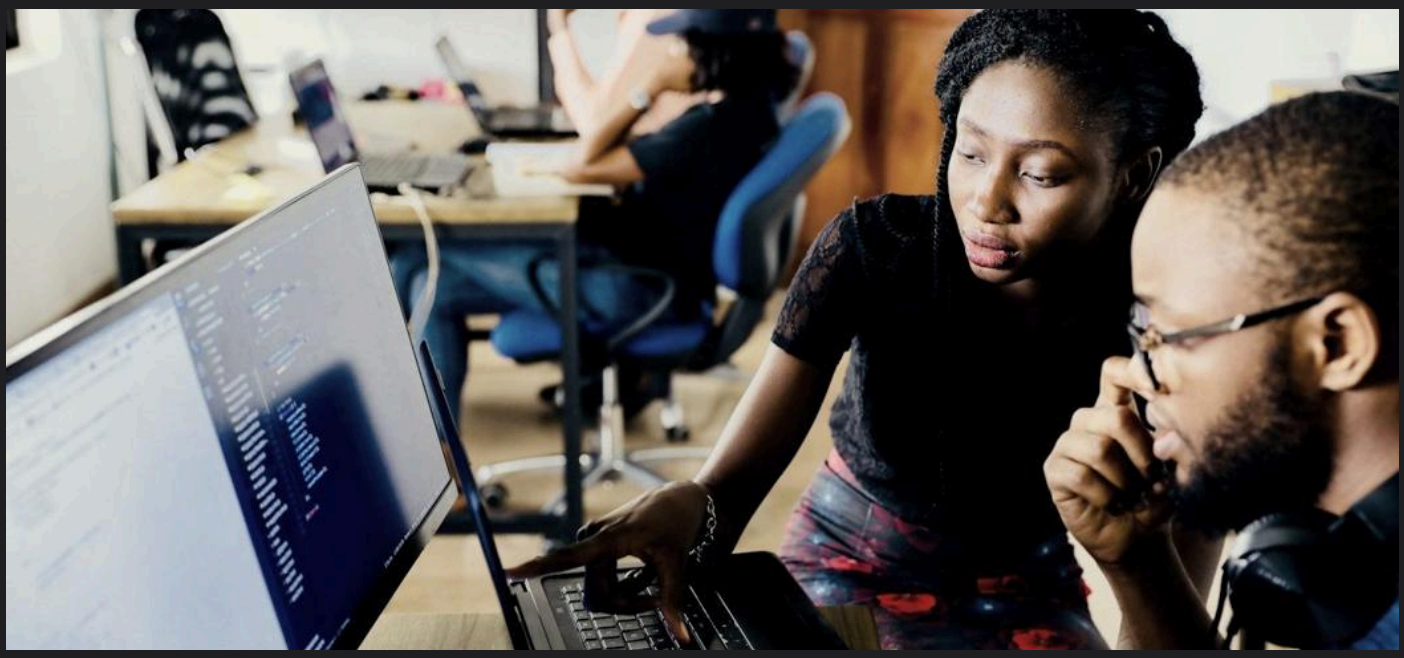
FAIR 01

Weeks 1–2: Problem Framing 02

Weeks 3–5: Data and Baselines 03

Weeks 6–9: Model Development 04

Weeks 10–11: Evaluation and Responsible AI 05



Python
Automation & scripting

PyTorch
Deep learning framework

Hugging Face
Open models & datasets

Projects & capstone

01

Reproducible Baseline Study

Reproduce a published baseline on a public dataset, documenting setup, metrics and any differences from reported results.

02

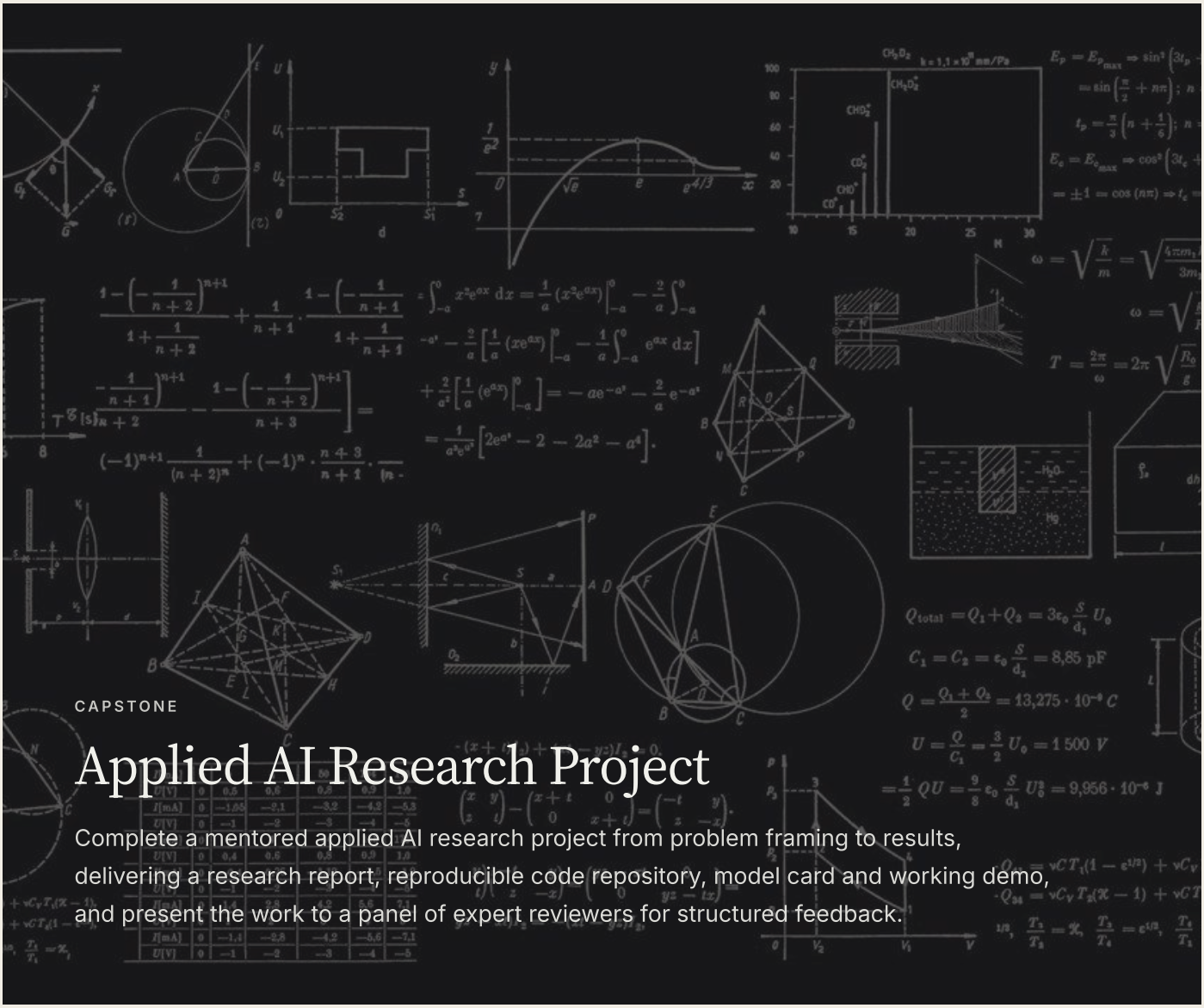
Fine-Tuning Experiment

Fine-tune a pretrained model for a focused task and compare variants through ablations with clearly tracked experiments.

03

Responsible AI Evaluation

Conduct error analysis and fairness checks on a trained model, summarising findings and limitations in a model card.



CAPSTONE

Applied AI Research Project

Complete a mentored applied AI research project from problem framing to results, delivering a research report, reproducible code repository, model card and working demo, and present the work to a panel of expert reviewers for structured feedback.

CERTIFICATION

SAM-IITAI

Awarded on successful completion of the program assessments.

- MCQ assessments
- Practical lab evaluation
- Project & capstone review
- Final presentation

HOW YOU LEARN · THE SAM LEARNING FRAMEWORK™

01 Scenario

Real-world attack and use-case scenarios open every module.

02 Apply

Hands-on lab work, CTF challenges and live projects.

03 Master

Assessment, peer review and certification prep.

04 Mentor

Post-program career guidance and support.



Delivery: Instructor-Led (ILT) · Virtual Instructor-Led · Self-Paced Online · E-Learning Licensing · Blended Learning · Corporate Onsite

Where this program fits

Advanced
You are here

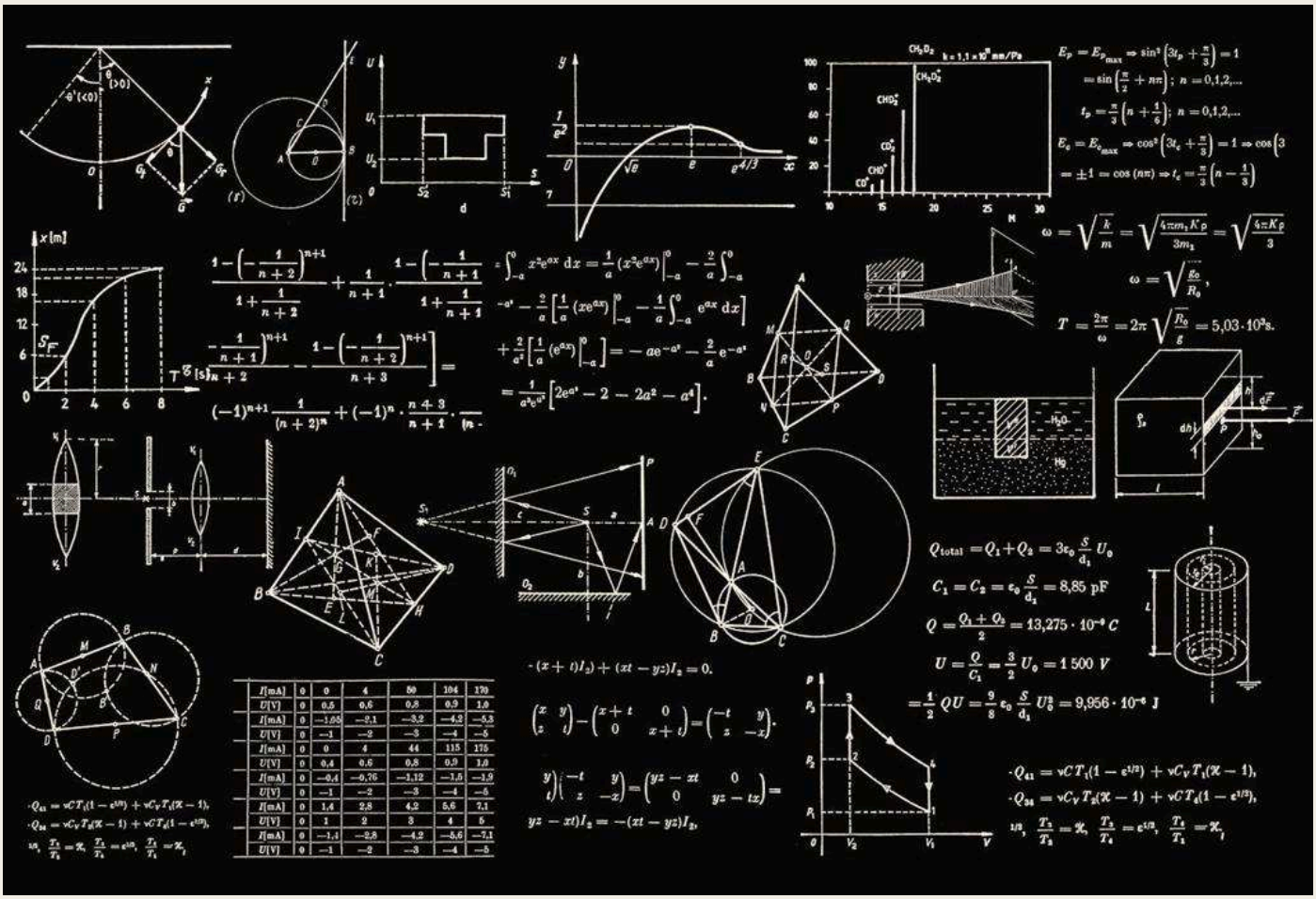
Expert
3 programs

BEFORE THIS

A starting point — no prerequisite program needed.

UP NEXT

Capture The Flag (CTF) Academy	Ongoing
Bug Bounty Training & Mentorship	3 Months
Startup Technology Incubation Support	6 Months



Questions, answered

Do I need prior experience to join?

Yes. This is an advanced-level program that assumes prior experience in Python, machine learning fundamentals and an ML framework. It moves quickly into frameworks, case studies and hands-on work, so participants should meet the listed prerequisites before enrolling.

How is the program delivered and scheduled?

The 3 months program is instructor-led and mentor-guided, delivered live virtual or in a blended format with partner institutions. It combines scheduled sessions, mentor check-ins and independent project work planned around the academic calendar.

Will I receive a certificate?

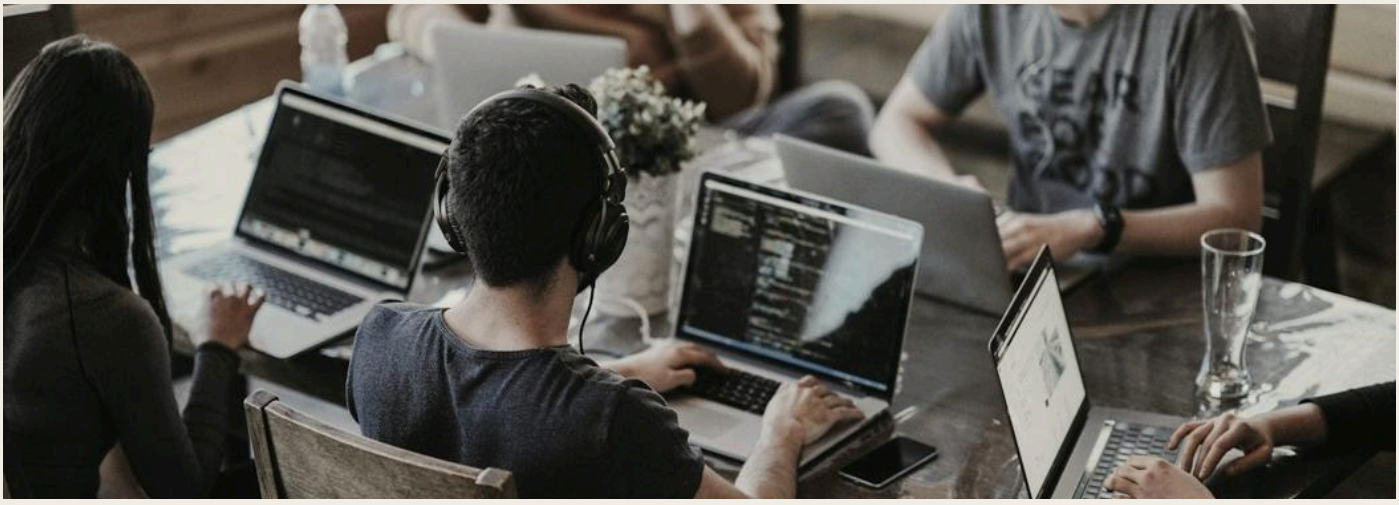
Yes. Participants who meet attendance requirements and successfully complete the assessments receive the Samcommunity Academy SAM-IITAI certificate. Assessments may include quizzes, practical exercises and a final capstone review, depending on the program format.

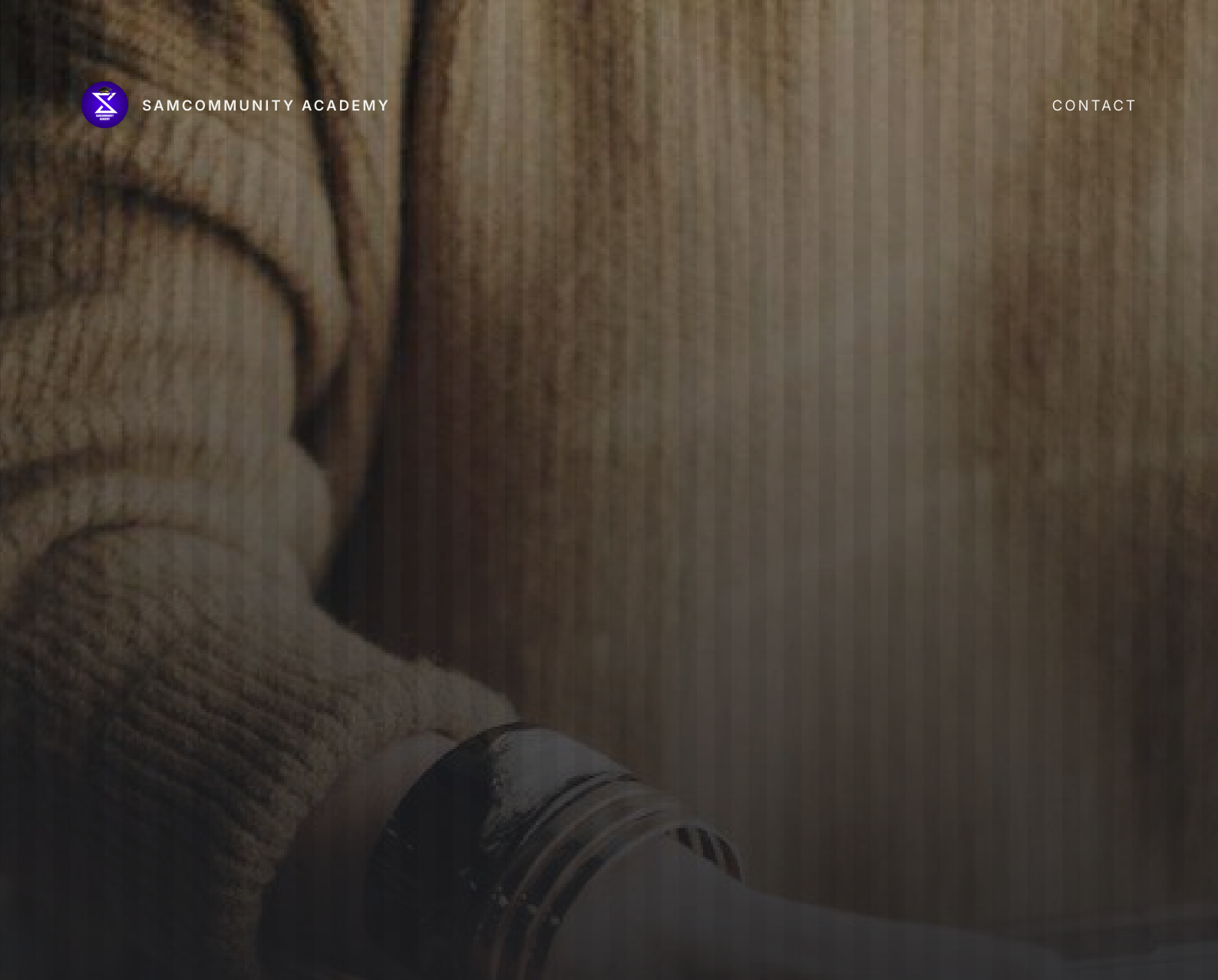
Will I get access to labs and tools?

Yes. Hands-on work uses a prepared lab environment with tools such as Python, PyTorch, Hugging Face. Access details are shared before the program starts, and all exercises run in isolated, authorised environments rather than live production systems.

Is career support included?

Participants receive mentor feedback, portfolio guidance and help presenting their work professionally. Samcommunity Academy may share relevant opportunities where available, but does not guarantee internships, jobs, rewards, bounty earnings or salary outcomes.





SAMCOMMUNITY ACADEMY

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