

ENGINEERING WORKSHOP SERIES

Engineering in the AI Era

Four years. Four distinct starting points.



One practical day per cohort

CSE / IT / AI & DS

A day built around student work



Illustration of a fictional workshop, not an event photograph.

405

learning minutes

75

minutes of breaks

60

learners per cohort*

Students make a prediction, run an experiment and explain the result. Paired practicals alternate with individual reasoning. Every day ends with evidence students can keep.

*Proposed delivery model with one lead facilitator and two mentors. 09:00–17:00. CPU-based exercises. No paid AI API required.

FIRST YEAR

Engineering in the AI Era 01

How can an engineer decide when to trust a machine?

THE PRACTICAL

Campus materials classifier

A classifier, an AI answer audit and a 30-day engineering roadmap.

WHAT YOU WILL PRACTISE

- 01 Separate rules, learned models and generative AI using concrete examples.
- 02 Train a nearest-centroid classifier and test it on unseen objects.
- 03 Explain one failure and one human decision that the model cannot make.
- 04 Write a weekly learning plan with a small verifiable project.

BEFORE THE DAY

No coding experience required. Basic arithmetic and curiosity are enough.

INDEPENDENT CHALLENGE

Remove `metallic_response`, rerun the model and explain how errors change. Submit the changed notebook, a confusion matrix and a paragraph about what measurement you would add.

SECOND YEAR

Machine Learning with Evidence

02

Does the model outperform a simple baseline on unseen data?

THE PRACTICAL

Campus energy alert model

An evaluated notebook, confusion matrix and model card.

WHAT YOU WILL PRACTISE

- 01 Separate features available at prediction time from future outcomes.
- 02 Train logistic regression with a held-out train/validation/test split.
- 03 Compare a majority baseline with precision and recall.
- 04 Choose a threshold using validation data and explain the trade-off.

BEFORE THE DAY

Basic Python variables, loops and functions. A 30-minute bridge worksheet is included.

INDEPENDENT CHALLENGE

Choose an alert policy on validation data using cost = $4 \cdot \text{FN} + \text{FP}$. Lock it, evaluate once on test data and compare with the majority baseline.

THIRD YEAR

Reliable Machine Learning 03

Will a convincing experiment survive a change in time and data?

THE PRACTICAL

Synthetic equipment maintenance study

A leakage report, chronological evaluation and tested experiment runner.

WHAT YOU WILL PRACTISE

- 01 Detect a post-event feature that leaks the target.
- 02 Compare a random split with chronological evaluation.
- 03 Record dataset and configuration hashes for reproducibility.
- 04 Test schema and inference behaviour and distinguish drift from failure.

BEFORE THE DAY

Python, arrays and a prior supervised learning exercise. Review the second-year notebook if needed.

INDEPENDENT CHALLENGE

Produce a two-column audit of flawed versus corrected experiments. Remove `repair_code`, use chronological evaluation, retain both reports and demonstrate a schema test.

FINAL YEAR

Applied AI Project Studio

04

Can another engineer test, operate and challenge your AI project?

THE PRACTICAL

Campus helpdesk triage prototype

A local prediction service, evaluation report, model card and project defence.

WHAT YOU WILL PRACTISE

- 01 Train an inspectable text classifier and evaluate a held-out test.
- 02 Add a review outcome for low-margin predictions.
- 03 Serve predictions locally with input validation and meaningful tests.
- 04 Defend the project with evidence, limitations and a feasible internship extension.

BEFORE THE DAY

Comfortable Python and basic ML evaluation. A prepared service scaffold is included.

INDEPENDENT CHALLENGE

Deliver a working localhost service with three successful and three rejected-request tests, held-out evaluation, review coverage and a one-page project handover.

Evidence students can explain

01 A working artifact

A notebook or local service, the dataset version and the recorded result.

02 An honest limitation

One failure example, a baseline comparison and a reasoned next experiment.

03 An individual defence

A short explanation of the student's own contribution and any AI assistance.

04 A next step

A seven-day challenge and a voluntary internship readiness application.

Workshop completion and internship admission are separate decisions. Future batch dates, seats, fees and selection rules require confirmation. No placement or accreditation promise is included.

For your institution

A practical programme, tailored to the cohort.

Programme faculty

Akash Chatake

Practitioner, researcher and educator

akashchatake.com

Delivery

Four distinct workshop days, or a selected year-specific day. The college provides the lab, projection, power, connectivity and a faculty coordinator. We agree dates and run a technical preflight.

Enquiries

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