



International Actuarial Association
Association Actuarielle Internationale



Education Workstream

2024 Achievements and Next Steps

February 2025

AI Summit San Francisco



From Artificial Intelligence to Actuarial Intelligence

IAA Response – Education

Statement of Intent:

- Determine potential impacts of AI on the education and training of actuaries (both initial and continuing education)

Key Issues

- What do actuaries need to learn? - different actuaries will have different needs
- Given the pace of change, it will be challenging to keep a syllabus up-to-date
- How should assessment of actuaries [with AI] evolve?
- Ensuring timely sharing of best practice examples and case studies with FMAs and individual actuaries

Deliverables

1. Collect information on AI Education Plans around the globe
2. Create a repository for AI-enhanced Actuary Case Studies
3. Create a proposal for Key AI Education Topics



Deliverables – Status, Description, Relevance / Next Steps

Status

- Deliverable 1: Collect information on AI Education Plans around the globe
- Deliverable 2: Create a repository for AI-enhanced Actuary Case Studies
- Deliverable 3: Create a proposal for Key AI Education Topics

Highlights / Links:

- Initial chart is available (next slide)
- [Repository](#) has been set up and everyone invited to contribute
- [Draft key topics document](#) with initial AI TF input received

Open Issues / Next Steps:

- Respond to AITF comments
- Updating existing chart.
- ② Incorporate Cases from other workstreams
- ③ Commence engagement with IAA Education Committee

Relevance to 2025:

- Research and Advancement will need key topics
- Repo sets up Case Studies and Tools Workstream



Education Plans around the globe: summary status

Middle East	Europe	UK & Africa	Asia	North & Central America	South America	Australia & New Zealand
Israel	Spain	United Kingdom	Japan	United States Details TBC; SoA offering seems advanced	Brazil	Australia
United Arab Emirates	Italy	South Africa	Singapore Elective subjects from IFoA	Canada	Argentina	
	France ● Summary structure different; standalone DS qualification	Rest of Southern Africa	China	Mexico Elective subjects from SoA	Columbia	New Zealand Elective subjects from Australia (majority) or IFoA
	Germany ● Summary structure different; additional DS qualification	Central Africa	India Awaiting information		Ecuador	
	Belgium Awaiting information	Northern Africa	Korea			
	Switzerland Dedicated website		Malaysia			
	The Netherlands					
	Denmark					
Key	Advanced offering	Offering in development	Electives from elsewhere	No structured offering	TBC	● Potential Language barrier

AI Enhanced Actuary Case Studies

AI Case Studies in Actuarial Science

- This is a collaborative space that focuses on the exploration and documentation of use cases for Artificial Intelligence (AI) within the field of actuarial science.

Topics

- [case-studies](#) [machine-learning](#) [artificial-intelligence](#) [actuarial-science](#) [large-language-models](#) [explainable AI](#) [Transparency](#) [Fairness](#) [Governance](#) [Ethics](#) [Accountability](#)

<https://github.com/IAA-AI-DS-test/AI-Case-Studies-in-Actuarial-Science>

Title	Resource(s)	Type	Level	Primary Topics	Secondary To
Binary Classification: Credit Scoring	Description , Notebook	Case Study	<div><div></div><div></div><div></div><div></div><div></div></div> Advanced	Machine Learning Tuning GPU Classification	Explainable Hyperparamet Claims Usage
SHAP for Actuaries: Explain Any Model	Article , Notebook	Educational	<div><div></div><div></div><div></div><div></div><div></div></div> Advanced	Explainable AI Interpretable HL	Regression Synthetic Op Claims Prediction
Case Study 1: Parsing Claims Descriptions	Article , Code	Case Study	<div><div></div><div></div><div></div><div></div><div></div></div> Advanced	Large Language Models	Information Extraction Parsing
Case Study 2: Identifying Emerging Risks	Article , Code	Case Study	<div><div></div><div></div><div></div><div></div><div></div></div> Beginner	Large Language Models	Text Generat
Model-Agnostic Explainability Methods for Regression Problems: A Case Study on Medical Costs Data	see folder "Case Study #5" in this repository	Educational	<div><div></div><div></div><div></div><div></div><div></div></div> Advanced	Explainable AI	Machine Learning Regression
Model-Agnostic Explainability Methods for Binary Classification Problems: A Case Study on Car Insurance Data	Notebook	Educational	<div><div></div><div></div><div></div><div></div><div></div></div> Advanced	Explainable AI	Machine Learning Classification
FEAT Principles Assessment Case Studies	Website , White Paper	Case Study	<div><div></div><div></div><div></div><div></div><div></div></div> Beginner	Fairness Ethics Accountability Transparency	Life Insurance Underwriting Fraud Detect Retail Marketing Credit Decisioning Customer Marketing
Compendium of Use Cases: Practical Illustrations of the Model AI Governance Framework	Website , White Paper (Volume 1) , White Paper (Volume 2)	Case Study	<div><div></div><div></div><div></div><div></div><div></div></div> Beginner	Governance	TODO

AI Education: topics for all Actuaries*

(*noting pace of change in this field)

Additional AI Topics for all Actuaries

The 2017 IAA Syllabus outlines what every actuary, regardless of discipline, need to know and be able to do. The relevant topics from that syllabus that relate to analytics and AI are in the Appendix. A subgroup was asked to develop a list of additional AI topics that are now relevant for all actuaries. While the IAA committee that maintains the syllabus may take this list under advisement, the purpose is not to recommend changes. It is to provide guidance to actuarial associations as they consider changing their approach to analytics and AI education. In some cases the recommendations are enhancements to existing syllabus items, in others they are additions.

The results are presented in two categories. The first is sometimes called "Narrow AI." It is applications designed to perform specific tasks, such as pricing or reserving, which are at the core of the technical work actuaries perform. They are tailored to solve particular actuarial problems and may not be applicable elsewhere.

The second is "General AI." These are AI systems that can potentially perform as well as, or better than, humans on a wide array of tasks. Large language models are one example.

The results are based on a survey of subgroup members plus a few other interested parties. Rather than report survey results, this report categorizes the recommended items as having strong support versus mixed support. Actuarial associations and educators may wish to prioritize those with strong support. In some cases there is further commentary after the statement of the topic.

Narrow AI Topics

Topics with strong support

Introduction to large language models: Introductory, perhaps with case studies. Perhaps how they can help with other narrow AI analyses.

Data Engineering: Very important, may be already covered in 6.1. Need to be sure depth/breadth is appropriate.

Model explainability: Weak coverage in 6.5.1. Critical knowledge for transparency and auditing.

Validation, auditing, and testing, model governance and deployment, monitoring and updating: A lot of topics here and unanimous support.

Ethics and responsible use of data and models: Covered in 6.4 but may be incomplete.

Communication (written, oral, and adjusting for various audiences)

Model development process: Understand the full process, the sum of its parts. The components are elsewhere, the key here is integrating them as a flow chart.

Importance of domain knowledge: Important to know that generic models can be deployed and assumed to be optimal.

Topics with mixed support

Advanced neural networks: While neural networks are viewed as very important, it was not clear if advanced knowledge (beyond that already in the IAA syllabus) should be mandatory. Rather it should be learned by those who need it.

Regulatory regimes/frameworks: May be too local for general education. Clearly actuaries need it at some point.

Cloud computing: Widely used, need to understand privacy and security issues.

Coding: May be covered in 6.2 and 6.3.4. It is not methods that are important but rather issues of privacy, security, reproducibility, and stability.

Natural Language Processing: Viewed as relevant for processing text data (not to be confused with Large Language Models).

General AI topics

Topics with strong support

Incorporating AI into actuarial work: But be aware that many tools are limited in their ability, only doing basic tasks.

Bias: Critical for both narrow and general AI. Cover both bias in the estimation process as well as bias in the algorithm providing disparate treatment.

Model governance and safety: Applies even more so here than in narrow AI.

Topics with mixed support

AI Agents: Concern that these are too opaque and could create ethical problems.

Specific AI tools: Concern that these are transitory, so not part of education for every actuary.

Leading innovation and decision making: Important, but not an AI issue.

Topics suggested, but no vote taken

Model evaluation (hallucinations, relevance, coherence)

Retrieval Augmented Generation (RAG)

Caching

Synthetic data

Model selection

Understanding when to use AI

Additional comment

It is very worthwhile to use current AI tools on basic activities, but not for cognitive and deep analysis tasks. The real concern is with regard to the reliability of the outcomes, their appropriateness to the problem solving, etc. furthermore, as many actuaries are tasked with technical processes with often little



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2nd IAA AI Summit

AI-Enabled Actuary

San Francisco
20-21 February 2025

Outcomes and Next Steps

21 February 2025



References / Resources

AI Task Force Workstreams for 2025/2026

—Engage and Educate—Practice—Implement→

Engagement and Foundations

- generate interest
- get actuaries started
- engage and build community
- "101-level"

Research and Advancement

- scan / organize "201" content
- develop research and educate
- advance the AI-enabled actuary

Case Studies and Tools

- compile and structure cases studies, examples, and tools for other workstreams

Adoption Framework

- focus on adoption, incorporating best practices, professionalism, governance, ethics, and practicality

[AI-Enabled Actuary 2025/2026 Workstreams brief descriptions](#)

The image features a close-up of a clear glass petri dish with its lid slightly ajar. A glass pipette is positioned over the dish, with a small droplet of liquid about to fall. The background is a blurred image of a DNA gel electrophoresis result, showing multiple lanes with horizontal bands of various colors including blue, green, yellow, and red. The overall scene suggests a laboratory or research environment.

Research and Advancement

Breakout Group 2

Research and Advancement

Key Outcomes and Recommended Next Steps

This workstream focuses on organizing and surfacing intermediate knowledge as well as encouraging the advancement of the AI-enabled actuary through practical research. The goal of this workstream is to meet the AITF objective of *scanning the AI environment relevant to actuaries...and supporting the education of actuaries in this field.*



Research & Advancement Structure





Knowledge base

- Tasks Knowledge base:
- Start with determining categories (End of March)
- Initial horizon scan (End of March)
 - Look at what topics are missing
- Engage with workstream 1 (Engagement - website) (Start in March understand contribution and possible design by end of April)
 - Design feedback loop for curation
- Sources all knowledge relevant to actuaries (FMA knowledge basis – initiated in May)
 - Then do initial upload
 - Strategically engage with FMA to keep us up to date (quarterly basis)
- IAA - AI Taskforce - May meeting
- Vetting process for articles (remove old articles) - Determine with discussion who approve for publishing.
- With Workstream 3 - engage for new user case coming from research
- Ongoing process



Advancing the AI-enabled Actuary

- Role of the actuary / research to fill gaps
- We will create a short term list and a long term list of how the role of the actuary will change.
- This will include skills/knowledge gaps as it relates to emerging AI technologies.
- We will also incorporate less technical topics like regulatory compliance, management of AI output, and analysis of which tasks / types of problems are most suitable for AI
- This substream will also perform an initial environmental scan and create a framework for staying current as AI evolves.
- As gaps are identified, the workstream will work with FMAs and other professions to fill those gaps.



Advancement through collaboration & communication

Concrete action items

- Ensuring two-way communication & collaboration with FMAs
 - Exchange of achievements with FMAs
 - Active input from FMAs
 - Start with core list of contacts
 - Consider communication approach with FMA members
- Ensuring two-way communication & collaboration with IAA and outside of IAA
 - Active sharing of information to ensure what to expect/what's coming in the space of AI is like with a Board exchange
 - Agreement of the groups to be in contact with and ways of workings
 - Advancement of interaction with supranationals
 - Availability to respond to information requests on the topic of AI in relation to actuaries



Advancement through collaboration & communication

- Agreement of Organisation model for research & advancement
 - Two-way interaction with Engagement & Foundation WS & AIforActuaries.org
 - Develop structure for sub-workstream deliverables into the wider AITF and other releases
 - Ways of working & collaboration with other workstreams
- Advancements of Partnerships
 - Exploration of feasibility of possible partnerships with Tech Firms
 - Actuarial partnerships with universities & academia
 - Active engagement with Adoption Framework to ensure no overlap



Proposed Next Steps (2025/2026)

- Get the group up and running eg.
 - Bringing those not attending up to speed and agree engagement
- Initiation of initial deliverables (first drafts by end March)
- Aim for early April re-group with the whole workstream
- Update to Executive Committee through AITF for IAA Council Meetings in Sao Paulo in May 2025
- Re-group every 6 weeks
- Help each other where needed
- Iterative approach throughout the year



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Update IAA Education Committee

ITEM 6: IAA Developments

AAE Education Committee Meeting

10 April 2025



IAA Education Committe

- Next meeting: 24 May 2025 in Sao Paolo
- Current topics:
 - Education reviews
 - AI developments
 - Proposed review of the IAA Education Syllabus
 - Discussion on mandatory CPD as a membership requirement