Generative AI in Scientific Research Training Course

Professional Development Training Course Outline

Category	Research and Data Analysis	**Duration**	5 Days
Base Fee	$1,500 USD	**Delivery Mode**	Online / On-site Hybrid

Course Introduction

Generative AI is revolutionizing the landscape of scientific research by accelerating discovery, enhancing predictive modeling, and automating complex data analysis. Generative AI in Scientific Research Training Course provides researchers, data scientists, and academic professionals with the tools to leverage AI-driven innovation, machine learning algorithms, and deep generative models to unlock new insights. Participants will learn to integrate cutting-edge technologies such as GPT-based models, transformers, and AI-assisted simulations into their research workflows, enabling faster, more accurate, and reproducible outcomes.

The course emphasizes practical applications of generative AI in various scientific domains, including drug discovery, genomics, material science, and climate modeling. Through interactive sessions, real-world case studies, and hands-on exercises, participants will develop expertise in AI-powered hypothesis generation, data augmentation, and automated experimental design. By the end of the program, learners will be equipped to drive innovation, enhance research efficiency, and remain at the forefront of AI-driven scientific breakthroughs.

Programme Curriculum

Generative AI in Scientific Research Training Course

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Course Objectives

1. Understand the fundamentals of Generative AI and its applications in scientific research.
2. Explore machine learning models, including GANs, VAEs, and transformers.
3. Develop skills in AI-driven data augmentation for large-scale scientific datasets.
4. Learn predictive modeling techniques for experimental research.
5. Implement natural language processing for literature review and hypothesis generation.
6. Automate experimental design and simulations using AI.
7. Enhance drug discovery pipelines with generative models.
8. Apply AI in genomics and proteomics research workflows.
9. Leverage computational material science for novel material discovery.
10. Evaluate AI-generated research outputs for accuracy and reproducibility.
11. Integrate cloud-based AI platforms into scientific research projects.
12. Develop ethical and responsible AI practices in scientific research.
13. Foster collaborative AI research for interdisciplinary innovation.

Target Audience

1. Academic researchers and faculty
2. PhD and postgraduate students in science and technology
3. Data scientists and AI specialists in research institutions
4. Pharmaceutical and biotechnology professionals
5. Computational biologists and chemists
6. Material scientists and engineers
7. Research managers and lab supervisors
8. AI enthusiasts interested in scientific applications

Course Modules

Module 1: Introduction to Generative AI in Science

- Fundamentals of AI and generative models
- Overview of GANs, VAEs, and transformers
- Applications in research and industry
- Current trends in AI-driven science
- Case Study: AI-assisted climate prediction models

Module 2: Data Handling and Preprocessing

- Cleaning and preparing scientific datasets
- Feature extraction using AI
- Data augmentation strategies
- Handling high-dimensional data
- Case Study: Genomic data preprocessing for AI modeling

Module 3: Machine Learning for Scientific Research

- Supervised vs. unsupervised learning
- Regression and classification in research
- Clustering and pattern recognition
- Model evaluation metrics
- Case Study: AI in predicting chemical reactions

Module 4: Generative Models for Research Innovation

- Understanding GANs and VAEs
- Text-to-data and data-to-text generation
- Model fine-tuning for scientific datasets
- Synthetic data generation
- Case Study: AI-generated protein structures

Module 5: AI in Drug Discovery and Genomics

- Molecular property prediction
- AI-guided compound screening
- Genomic data analysis with AI
- Automated hypothesis testing
- Case Study: AI-designed small molecules for cancer research

Module 6: AI in Material Science and Engineering

- Predicting material properties with AI
- Generative design for novel materials
- Simulation optimization using AI
- Integrating AI with CAD tools
- Case Study: AI-assisted alloy discovery

Module 7: Natural Language Processing in Scientific Research

- Literature mining and summarization
- Hypothesis generation from publications
- Semantic search in scientific databases
- Automating systematic reviews
- Case Study: NLP-assisted COVID-19 research insights

Module 8: Ethics, Reproducibility, and Future Trends

- AI ethics and bias mitigation
- Ensuring reproducibility of AI research
- Open science and AI collaboration
- Future directions of AI in scientific discovery

- Case Study: Ethical AI in clinical trial simulations

Training Methodology

This course employs a participatory and hands-on approach to ensure practical learning, including:

- Interactive lectures and presentations.
- Group discussions and brainstorming sessions.
- Hands-on exercises using real-world datasets.
- Role-playing and scenario-based simulations.
- Analysis of case studies to bridge theory and practice.
- Peer-to-peer learning and networking.
- Expert-led Q&A sessions.
- Continuous feedback and personalized guidance.

Register as a group from 3 participants for a Discount

Send us an email: info@fineskilltrainingcenter.org or call *+254769199797*

Certification

Upon successful completion of this training, participants will be issued with a globally- recognized certificate.

Tailor-Made Course

We also offer tailor-made courses based on your needs.

Key Notes

a. The participant must be conversant with English.

b. Upon completion of training the participant will be issued with an Authorized Training Certificate

c. Course duration is flexible and the contents can be modified to fit any number of days.

d. The course fee includes facilitation training materials, 2 coffee breaks, buffet lunch and A Certificate upon successful completion of Training.

e. One-year post-training support Consultation and Coaching provided after the course.

f. Payment should be done at least a week before commence of the training, to Fineskill Training Center account, as indicated in the invoice so as to enable us prepare better for you.

Upcoming Scheduled Sessions

Start Date	End Date	Location	Price

23 Nov 2026	27 Nov 2026	Online	$1,000
23 Nov 2026	27 Nov 2026	Physical	$1,500
23 Nov 2026	27 Nov 2026	Physical	$3,000
23 Nov 2026	27 Nov 2026	Physical	$3,000
23 Nov 2026	27 Nov 2026	Physical	$6,000
23 Nov 2026	27 Nov 2026	Physical	$4,500
23 Nov 2026	27 Nov 2026	Physical	$6,000
23 Nov 2026	27 Nov 2026	Physical	$6,000

Ready to enroll or request a customized program? Book online or contact us:

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