Responsible AI and Algorithmic Fairness in 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

As Artificial Intelligence (AI) systems become deeply embedded in decision-making processes, ensuring responsible and ethical practices in AI research has become a global imperative. Responsible AI and Algorithmic Fairness in Research Training Course empowers professionals, researchers, and developers with the tools and frameworks necessary to design and implement transparent, accountable, and non-biased AI systems. With the growing societal and regulatory focus on ethical AI, understanding algorithmic fairness, AI ethics, and bias mitigation techniques is no longer optional—it's essential for trust, equity, and sustainable innovation.

This hands-on course bridges data science, machine learning, social impact, and policy development to tackle real-world challenges. Participants will engage in case-driven learning, reflecting on current failures in AI fairness and developing actionable strategies to create equitable, inclusive, and auditable AI models in research contexts. By the end of this course, learners will possess not only theoretical insights but also practical skills in ensuring AI systems serve all communities fairly.

Programme Curriculum

Responsible AI and Algorithmic Fairness in Research Training Course

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Course Objectives

Participants will:

1. Understand the foundations of Responsible AI and its societal implications.
2. Analyze types and sources of algorithmic bias in AI systems.
3. Apply ethical frameworks in AI research and development.
4. Explore global AI governance and regulatory frameworks.
5. Develop techniques for bias detection and fairness audits in datasets.
6. Implement transparency and explainability in AI models.
7. Evaluate the impact of AI decisions on marginalized populations.
8. Integrate human-centered AI approaches in system design.
9. Examine the role of intersectionality in fairness assessments.
10. Use open-source tools for fairness and accountability in ML.
11. Understand privacy, security, and data ethics concerns.
12. Promote interdisciplinary collaboration in ethical AI research.
13. Present responsible AI research outcomes using reproducible methods.

Target Audience

1. AI Researchers
2. Data Scientists and Machine Learning Engineers
3. University Faculty and Students
4. Government and Policy Analysts
5. Social Scientists and Ethicists
6. Technology Journalists
7. Business Leaders and Tech Entrepreneurs
8. NGOs and Civil Rights Advocates

Course Duration: 5 days

Course Modules

Module 1: Introduction to Responsible AI and Ethics

- Define Responsible AI, its scope and relevance
- Overview of key ethical principles in AI
- Historical failures and controversies in AI fairness
- Ethical decision-making in AI design
- Stakeholder roles in responsible development
- **Case Study**: COMPAS Recidivism Risk Assessment Tool

Module 2: Understanding Algorithmic Bias

- Types of algorithmic bias (historical, representation, measurement)
- Sources of data-driven bias
- Societal impact of biased algorithms
- Techniques to identify and measure bias
- Mitigation strategies overview

- **Case Study**: Racial bias in facial recognition systems

Module 3: Fairness Metrics and Frameworks

- Group vs. individual fairness definitions
- Popular fairness metrics in ML (Equal Opportunity, Demographic Parity)
- Trade-offs between accuracy and fairness
- Model auditing for fairness
- Integrating fairness during model training
- **Case Study**: Fairness in credit scoring algorithms

Module 4: Transparency and Explainability in AI

- Importance of explainable AI (XAI)
- Tools and frameworks (LIME, SHAP, etc.)
- Communicating model decisions to stakeholders
- Transparency laws (GDPR, AI Act)
- Documentation and model cards
- **Case Study**: Explainability in healthcare diagnostics AI

Module 5: Data Ethics and Governance

- Informed consent and data collection ethics
- Privacy-preserving techniques (differential privacy, federated learning)
- Data stewardship and accountability
- Regulatory frameworks (EU AI Act, OECD principles)
- Bias in data annotation and labeling
- **Case Study**: Ethical challenges in COVID-19 data sharing

Module 6: Human-Centered AI Design

- Principles of inclusive and accessible AI
- Participatory design approaches
- User feedback loops in model refinement
- AI for social good frameworks
- Avoiding over-automation and harm
- **Case Study**: Inclusive AI in public services

Module 7: Tools for Fairness and Bias Mitigation

- Introduction to open-source fairness tools (AI Fairness 360, Fairlearn)
- Pre-processing and in-processing techniques
- Post-processing approaches for outcome fairness
- Fair feature selection
- Integrating tools into research pipelines
- **Case Study**: Bias correction in hiring algorithms using Fairlearn

Module 8: Policy, Accountability, and Future Directions

- AI accountability and redress mechanisms
- Global policy trends and governance models
- Role of public engagement and transparency
- Interdisciplinary collaboration in policy design
- Future of AI fairness in research and industry
- **Case Study**: Algorithmic transparency in public sector decision-making

Training Methodology

- Interactive lectures and instructor-led demonstrations
- Real-world case study discussions and group analysis
- Hands-on labs with open-source AI fairness tools
- Role-play and ethical scenario simulation
- Assessment quizzes and peer-reviewed mini-projects
- Capstone project for responsible AI proposal development

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

Start Date	End Date	Location	Price
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:

Register Online Now

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