Data Workflow Automation with Airflow/Prefect 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

In today’s data-driven world, researching sensitive topics requires not only ethical diligence but also sophisticated automation tools that ensure accuracy, confidentiality, and compliance. Data Workflow Automation with Airflow/Prefect Training Course on Data Workflow Automation using Apache Airflow and Prefect provides professionals with the cutting-edge techniques needed to streamline complex data pipelines related to sensitive information. Whether it's in public health, human rights, gender issues, or conflict zones, this course ensures data workflows are secure, reproducible, and scalable.

Participants will gain hands-on experience with workflow orchestration, data lineage tracking, and error handling while working with real-world case studies in sensitive domains. The training combines ethical research frameworks with modern tools like Airflow, Prefect, and Python-based DAGs to automate data collection, transformation, validation, and reporting—empowering organizations to handle sensitive research topics with agility and care.

Programme Curriculum

Data Workflow Automation with Airflow/Prefect Training Course

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modern tools like Airflow, Prefect, and Python-based DAGs to automate data collection, transformation, validation, and reporting—empowering organizations to handle sensitive research topics with agility and care.

Course Objectives

1. Understand ethical considerations in handling sensitive datasets
2. Build scalable ETL pipelines using Airflow and Prefect
3. Automate data validation and integrity checks
4. Master workflow orchestration for research projects
5. Implement data privacy and compliance in automated flows
6. Integrate real-time data monitoring and alerting systems
7. Apply modular pipeline architecture for flexible research designs
8. Use parameterization and templating in Airflow/Prefect DAGs
9. Visualize data lineage and provenance in sensitive workflows
10. Schedule and manage automated reporting systems
11. Detect and mitigate pipeline failures and retries
12. Apply version control in workflows for sensitive research
13. Deploy cloud-native workflow solutions for global research teams

Target Audiences:

1. Data Scientists working with sensitive topics
2. Public Health Researchers
3. Social Scientists and Policy Analysts
4. Journalists and Investigative Reporters
5. NGO Data Managers
6. Academic Researchers handling confidential data
7. Government Data Officers
8. AI/ML Engineers in regulated industries

Course Duration: 5 days

Course Modules

Module 1: Ethical Foundations for Sensitive Data Research

- Ethical frameworks for working with vulnerable populations
- Regulatory compliance: GDPR, HIPAA, IRBs
- Risk mitigation in automated data workflows
- Informed consent in digital environments
- Data anonymization techniques
- **Case Study**: Automating workflows in a public health study on domestic violence

Module 2: Introduction to Airflow and Prefect

- Comparing Airflow vs Prefect: Features and use cases
- DAG (Directed Acyclic Graph) design principles
- Core components: Tasks, Flows, and Schedules
- Installation and configuration best practices
- Intro to Prefect Orion and Airflow UI
- **Case Study**: Setting up a pipeline for analyzing gender-based violence reports

Module 3: Designing Secure and Scalable ETL Pipelines

- Modular pipeline architecture for sensitive data

- Creating reusable operators and tasks
- Handling large datasets securely
- Secure data transfer protocols
- Parallel processing and scalability
- **Case Study**: Automating data collection from crisis response platforms

Module 4: Data Validation, Testing, and Auditing

- Incorporating data quality checks
- Schema validation and anomaly detection
- Unit testing with pytest for DAGs
- Logging and audit trails
- Alerting for data anomalies
- **Case Study**: Quality assurance in survey-based research on trauma survivors

Module 5: Orchestrating Complex Research Workflows

- Task dependencies and branching logic
- Dynamic task generation
- Parameterization and environment variables
- Workflow state management
- Scheduled and event-driven flows
- **Case Study**: Multi-region workflow for conflict zone news aggregation

Module 6: Metadata Management and Data Lineage

- Tracking data provenance
- Metadata storage with XComs and Prefect Artifacts
- Versioning workflows
- Visualizing dependencies and lineage graphs
- Data recovery strategies
- **Case Study**: Tracking source credibility in online misinformation research

Module 7: Advanced Deployment and Monitoring

- CI/CD for DAGs with GitHub Actions
- Using Docker and Kubernetes for deployment
- Cloud orchestration with GCP, AWS, Azure
- Integrating Slack/email for real-time alerts
- Monitoring with Grafana/Prometheus
- **Case Study**: Scaling an NGO’s refugee data pipeline to multiple regions

Module 8: Real-World Project & Capstone

- Design your own sensitive-topic workflow
- Integrating ethics into technical implementation
- Simulate failure recovery
- Prepare a compliance-ready documentation set
- Peer review and iterative improvement
- **Case Study**: Capstone project – A data workflow for tracking hate speech incidents

Training Methodology

- Hands-on coding sessions using real-world scenarios
- Live demo and walkthroughs of Airflow & Prefect pipelines
- Group discussions around ethical dilemmas and risk mitigation

- Case study analysis and simulation-based learning
- Continuous assessment through quizzes and project reviews
- Access to GitHub repo with pre-built templates

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

Start Date	End Date	Location	Price
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

Email: info@fineskilltrainingcenter.com | Website: www.fineskilltrainingcenter.com