Time Series Forecasting with Deep Learning 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, navigating sensitive research domains—such as trauma, health, gender, conflict, and political instability—requires deep ethical understanding, nuanced methodologies, and advanced analytical tools. Researchers must engage vulnerable populations and taboo subjects with care, transparency, and cultural sensitivity. Time Series Forecasting with Deep Learning Training Course empowers participants to master these practices using best-in-class frameworks and real-world case studies, ensuring data integrity while protecting human dignity.

Simultaneously, the ability to forecast time series data using deep learning techniques is revolutionizing industries from healthcare to finance. Leveraging LSTM, GRU, and Transformer-based models, participants will gain a comprehensive understanding of modeling temporal data, trend extraction, anomaly detection, and future event prediction. Combining sensitivity in data collection with the power of AI-based forecasting, this dual-focus course provides a unique, actionable blend of qualitative and quantitative skillsets essential for today’s researchers and data scientists.

Programme Curriculum

Time Series Forecasting with Deep Learning Training Course

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Course Objectives

1. Understand ethical frameworks in sensitive data collection.
2. Apply trauma-informed research methodologies.
3. Analyze privacy-preserving techniques for high-risk subjects.
4. Design inclusive research tools for marginalized communities.
5. Build time series forecasting models using deep learning.
6. Implement LSTM and GRU networks for sequential prediction.
7. Use Transformer models for long-term temporal analysis.
8. Evaluate models using MAE, RMSE, MAPE, and F1-scores.
9. Perform data preprocessing and feature engineering on time series.
10. Apply bias mitigation strategies in both sensitive and numerical datasets.
11. Visualize results using interactive dashboards (e.g., Plotly, Dash).
12. Conduct real-world case studies using Python and TensorFlow/Keras.
13. Develop cross-disciplinary projects combining ethical research and AI.

Target Audience

1. Social Science Researchers
2. Data Scientists and Analysts
3. Public Health Researchers
4. Academic Institutions and PhD Students
5. Human Rights & Advocacy Organizations
6. Government & Policy Analysts
7. Financial & Economic Analysts
8. AI/ML Engineers and Developers

Course Duration: 5 days

Course Modules

Module 1: Foundations of Researching Sensitive Topics

- Understanding types of sensitive topics
- Risks in researching vulnerable groups
- Informed consent and participant rights
- Cultural sensitivity and intersectionality
- Ethical review boards and compliance
- **Case Study:** Gender-based violence research in rural Kenya

Module 2: Trauma-Informed and Inclusive Methodologies

- Defining trauma-informed research
- Psychological safety for participants
- Participatory and co-design frameworks
- Language use and contextual framing
- Diversity and intersectional sampling

- **Case Study:** LGBTQ+ youth mental health studies

Module 3: Data Privacy & Ethical Risk Mitigation

- Anonymization and pseudonymization techniques
- Secure data storage protocols
- GDPR and international compliance
- AI in ethical screening
- Risk mitigation for secondary data use
- **Case Study:** COVID-19 contact tracing data ethics

Module 4: Introduction to Time Series Forecasting

- Fundamentals of temporal datasets
- Trend, seasonality, and noise analysis
- Stationarity and differencing
- Lag features and rolling windows
- Forecast evaluation metrics
- **Case Study:** Electricity consumption forecasting

Module 5: LSTM and GRU for Time Series Modeling

- RNN basics and sequence modeling
- Building LSTM models in TensorFlow
- Comparing GRU vs LSTM
- Model tuning and hyperparameter optimization
- Forecasting future time steps
- **Case Study:** Financial market prediction using LSTM

Module 6: Transformer-based Deep Learning Models

- Attention mechanisms in time series
- Encoder-decoder architectures
- Implementing Transformers for forecasting
- Long-term dependency modeling
- Training with large datasets
- **Case Study:** Demand forecasting in supply chain logistics

Module 7: Advanced Forecasting & Visualization Tools

- Using Prophet, ARIMA, and hybrid models
- Integrating ML models with dashboards (Plotly, Dash)
- Interactive storytelling with data
- Automated pipelines for real-time forecasting
- Interpreting model outputs responsibly
- **Case Study:** Real-time air quality monitoring dashboard

Module 8: Integrative Project – From Sensitive Data to AI Forecasting

- Designing a complete research-forecasting pipeline
- Integrating ethical qualitative research with time series models
- Building actionable insights for decision-makers
- Cross-validation and peer review process
- Presentation and documentation
- **Case Study:** Predicting refugee camp resource needs using sensitive demographic data

Training Methodology

- Interactive expert-led live sessions
- Hands-on Python labs using real datasets
- Group activities and ethical dilemma simulations
- One-on-one project mentorship
- Final project presentations with feedback

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

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