Neural Networks in Forecasting Training Course

Professional Development Training Course Outline

Category	Logistics and Supply Chain Management	**Duration**	10 Days
Base Fee	$3,000 USD	**Delivery Mode**	Online / On-site Hybrid

Course Introduction

The increasing complexity of global markets and rapid data expansion has necessitated the adoption of advanced analytical techniques to enhance forecasting accuracy and decision-making. Neural networks, as a subset of artificial intelligence, offer unparalleled capabilities in modeling complex, nonlinear relationships within datasets. Neural Networks in Forecasting Training Course provides participants with a comprehensive understanding of neural networks for predictive analytics, covering both theoretical frameworks and practical applications. Participants will gain hands-on experience in designing, implementing, and evaluating neural network models to forecast trends in finance, sales, supply chain management, and other dynamic business environments.

With a strong focus on real-world applications and industry-relevant case studies, this course equips learners with the technical proficiency and strategic insight to transform raw data into actionable forecasts. Participants will explore various neural network architectures, including feedforward, recurrent, and convolutional networks, and their applications in time-series forecasting. By integrating data preprocessing techniques, model evaluation metrics, and optimization strategies, learners will develop robust forecasting models that support data-driven decision-making, competitive advantage, and organizational growth.

Programme Curriculum

Neural Networks in Forecasting Training Course

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Course Objectives

1. Understand the fundamentals of neural networks and deep learning in forecasting
2. Explore data preprocessing and feature engineering techniques for time-series analysis
3. Design and implement feedforward neural network models
4. Utilize recurrent neural networks (RNN) for sequential data forecasting
5. Apply convolutional neural networks (CNN) in predictive analytics
6. Evaluate model performance using error metrics and validation techniques
7. Optimize neural network models for improved forecasting accuracy
8. Integrate external datasets and handle missing data in predictive modeling
9. Implement real-world forecasting scenarios using Python and TensorFlow/Keras
10. Understand the role of hyperparameter tuning in model optimization
11. Explore ensemble techniques combining neural networks with other predictive models
12. Analyze case studies to identify best practices and pitfalls in forecasting
13. Develop strategic insights for data-driven decision-making in organizations

Organizational Benefits

- Improved accuracy in business forecasting and demand planning
- Enhanced ability to predict market trends and customer behavior
- Increased efficiency in resource allocation and inventory management
- Reduced risks associated with uncertainty in strategic planning
- Strengthened competitive advantage through advanced analytics capabilities
- Faster adaptation to dynamic market conditions
- Improved decision-making through actionable data insights

- Better integration of cross-departmental data for holistic forecasting
- Enhanced employee skills in AI and machine learning applications
- Support for innovation and technology-driven organizational growth

Target Audiences

1. Data analysts and business analysts
2. Financial planners and forecasters
3. Supply chain managers and logistics professionals
4. Marketing analysts and strategists
5. IT professionals and software developers
6. Operations managers seeking predictive insights
7. Academic researchers in AI and forecasting
8. Decision-makers in corporate strategy and planning

Course Duration: 10 days

Course Modules

Module 1: Introduction to Neural Networks in Forecasting

- Overview of neural networks and AI
- Historical development of forecasting models
- Importance of neural networks in predictive analytics
- Key concepts and terminologies in neural networks
- Case study: Forecasting retail sales using neural networks
- Practical exercises in Python

Module 2: Data Preprocessing and Feature Engineering

- Cleaning and transforming datasets
- Handling missing values and outliers
- Feature selection techniques
- Normalization and standardization
- Case study: Preparing financial data for neural network modeling
- Hands-on preprocessing exercises

Module 3: Feedforward Neural Networks

- Architecture and components
- Activation functions and backpropagation
- Designing a feedforward model for forecasting
- Overfitting and regularization techniques
- Case study: Forecasting energy consumption
- Implementation in Python/TensorFlow

Module 4: Recurrent Neural Networks (RNNs)

- Understanding sequential data
- LSTM and GRU architectures
- Building RNNs for time-series forecasting
- Model evaluation for sequential predictions
- Case study: Stock price prediction using RNN
- Hands-on exercises

Module 5: Convolutional Neural Networks (CNNs) in Forecasting

- CNN fundamentals for structured data
- Feature extraction and convolution layers
- CNN applications beyond image recognition
- Forecasting patterns in multivariate datasets
- Case study: Predicting demand in retail chains
- Practical implementation exercises

Module 6: Model Evaluation and Performance Metrics

- Common forecasting error metrics
- Confusion matrix for classification tasks
- Cross-validation techniques
- Hyperparameter tuning for better results
- Case study: Comparing model accuracy across datasets
- Evaluation exercises

Module 7: Advanced Optimization Techniques

- Gradient descent variants

- Learning rate schedules
- Regularization and dropout methods
- Ensemble learning strategies
- Case study: Optimizing neural networks for sales forecasting
- Hands-on optimization exercises

Module 8: Forecasting with External Data Integration

- Incorporating macroeconomic indicators
- Handling missing or incomplete data
- Merging internal and external datasets
- Case study: Forecasting product demand using external market data
- Practical integration exercises
- Model testing exercises

Module 9: Hyperparameter Tuning and Model Selection

- Grid search and random search
- Bayesian optimization techniques
- Automating hyperparameter tuning
- Case study: Improving forecasting performance in manufacturing
- Python implementation exercises
- Model selection comparison

Module 10: Real-World Forecasting Scenarios

- Demand forecasting in retail
- Financial time-series predictions
- Supply chain and inventory optimization
- Case study: Real-world scenario analysis
- Practical exercises
- Strategic insights

Module 11: Forecasting Using Ensemble Methods

- Combining multiple models
- Bagging, boosting, and stacking techniques

- Evaluating ensemble performance
- Case study: Ensemble neural networks for improved forecasting
- Hands-on exercises
- Performance evaluation

Module 12: Case Studies in Neural Network Forecasting

- Retail and e-commerce
- Energy and utilities
- Finance and banking
- Case study: Lessons learned from real-world implementations
- Analysis of forecasting challenges
- Hands-on scenario simulation

Module 13: Neural Network Deployment and Monitoring

- Model deployment strategies
- Monitoring and updating models
- Integration with business systems
- Case study: Deploying forecasting models in production
- Practical implementation exercises
- Continuous evaluation

Module 14: Ethical Considerations in Forecasting

- Data privacy and security
- Ethical use of AI in forecasting
- Bias and fairness in models
- Case study: Ethical implications in predictive analytics
- Group discussions
- Scenario analysis

Module 15: Strategic Insights and Decision-Making

- Translating forecasts into business decisions
- Communicating predictions effectively
- Future trends in neural network forecasting

- Case study: Organizational decision-making using forecasts
- Practical exercises
- Action planning

Training Methodology

- Interactive lectures with real-world examples
- Hands-on exercises using Python, TensorFlow, and Keras
- Case study analysis for practical understanding
- Group discussions and collaborative problem-solving
- Quizzes and assessments to track learning progress
- Project work to implement forecasting models in real scenarios

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	04 Dec 2026	Online	$2,000

Start Date	End Date	Location	Price
23 Nov 2026	04 Dec 2026	Physical	$3,000
23 Nov 2026	04 Dec 2026	Physical	$6,000
23 Nov 2026	04 Dec 2026	Physical	$6,000
23 Nov 2026	04 Dec 2026	Physical	$12,000
23 Nov 2026	04 Dec 2026	Physical	$9,000
23 Nov 2026	04 Dec 2026	Physical	$12,000
23 Nov 2026	04 Dec 2026	Physical	$12,000

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

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