Predictive Modeling in Healthcare 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

Predictive modeling in healthcare is revolutionizing patient care, operational efficiency, and clinical decision-making by leveraging **advanced analytics, artificial intelligence (AI), and machine learning (ML)**. Predictive Modeling in Healthcare Training Course empowers healthcare professionals, data scientists, and analysts to harness the power of predictive models to forecast patient outcomes, reduce hospital readmissions, and optimize resource allocation. Participants will explore real-world healthcare datasets, uncover hidden patterns, and transform complex clinical data into actionable insights that drive evidence-based decision-making.

In today's data-driven healthcare ecosystem, organizations are embracing **predictive analytics, big data solutions, and precision medicine** to improve patient safety, enhance population health, and reduce operational costs. This training combines hands-on exercises, case studies, and industry-relevant tools to equip learners with the skills to implement predictive models, interpret results, and deliver tangible improvements in clinical and operational outcomes.

Programme Curriculum

Predictive Modeling in Healthcare Training Course

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5 days

Course Objectives

By the end of this course, participants will be able to:

1. Understand the fundamentals of predictive modeling, machine learning, and AI in healthcare.
2. Apply data preprocessing, feature engineering, and data cleaning techniques on healthcare datasets.
3. Build and evaluate supervised and unsupervised machine learning models for patient outcome predictions.
4. Utilize risk stratification and predictive scoring to improve clinical decision-making.
5. Implement readmission prediction models for hospitals using real-world datasets.
6. Apply predictive analytics in population health management.
7. Use regression, classification, and clustering algorithms in healthcare scenarios.
8. Interpret model outputs with explainable AI (XAI) and SHAP values for clinical transparency.
9. Deploy predictive models in electronic health record (EHR) systems.
10. Leverage cloud-based analytics platforms and healthcare AI tools.
11. Perform time series forecasting for patient volume and resource planning.
12. Analyze healthcare KPIs using data visualization and business intelligence dashboards.
13. Develop a data-driven culture for predictive healthcare solutions.

Target Audience

- Healthcare data scientists and analysts
- Clinical informaticists and healthcare IT professionals
- Hospital administrators and managers
- Medical researchers and epidemiologists
- AI and ML professionals in healthcare
- Public health specialists
- Healthcare consultants
- Students pursuing health informatics and biomedical data science

Course Modules

Module 1: Introduction to Predictive Modeling in Healthcare

- Overview of predictive analytics in healthcare
- supervised, unsupervised, and reinforcement learning
- Role of AI and ML in clinical decision-making
- Case Study: Predicting patient readmissions at a large hospital
- precision medicine and population health analytics

Module 2: Healthcare Data Collection & Preprocessing

- Understanding EHR, claims, and clinical trial datasets
- Data cleaning, handling missing values, and normalization
- Feature selection and engineering for healthcare
- Case Study: Cleaning and preparing patient data for predictive modeling
- Python, R, SQL

Module 3: Regression Models in Healthcare

- Linear and logistic regression applications
- Risk prediction modeling
- Model evaluation metrics
- Case Study: Predicting chronic disease progression
- Building regression models with Python

Module 4: Classification Techniques

- Decision trees, random forests, and gradient boosting
- Model tuning and hyperparameter optimization
- Handling imbalanced datasets in healthcare
- Case Study: Early detection of sepsis in ICU patients
- scikit-learn, XGBoost

Module 5: Clustering & Unsupervised Learning

- K-means, hierarchical clustering, and anomaly detection
- Identifying patient subgroups for targeted interventions
- Evaluating cluster quality
- Case Study: Segmenting diabetic patients for personalized care
- Practical exercises using real-world datasets

Module 6: Time Series Forecasting in Healthcare

- Forecasting patient admissions and resource requirements
- ARIMA, Prophet, and LSTM models
- Evaluating forecasting models
- Case Study: Predicting emergency department patient volume
- Hands-on session with Python time series libraries

Module 7: Explainable AI & Model Interpretation

- Importance of interpretability in healthcare models
- SHAP values, LIME, and feature importance techniques
- Ethical AI considerations in healthcare
- Case Study: Transparent AI for ICU patient risk scoring
- Tools for visualization and reporting

Module 8: Deployment & Practical Implementation

- Integrating predictive models with EHR systems
- Cloud platforms for AI deployment (AWS, Azure, GCP)
- Building dashboards and visualization for decision-makers
- Case Study: Predictive model for hospital staffing optimization

- Best practices and model monitoring

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

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