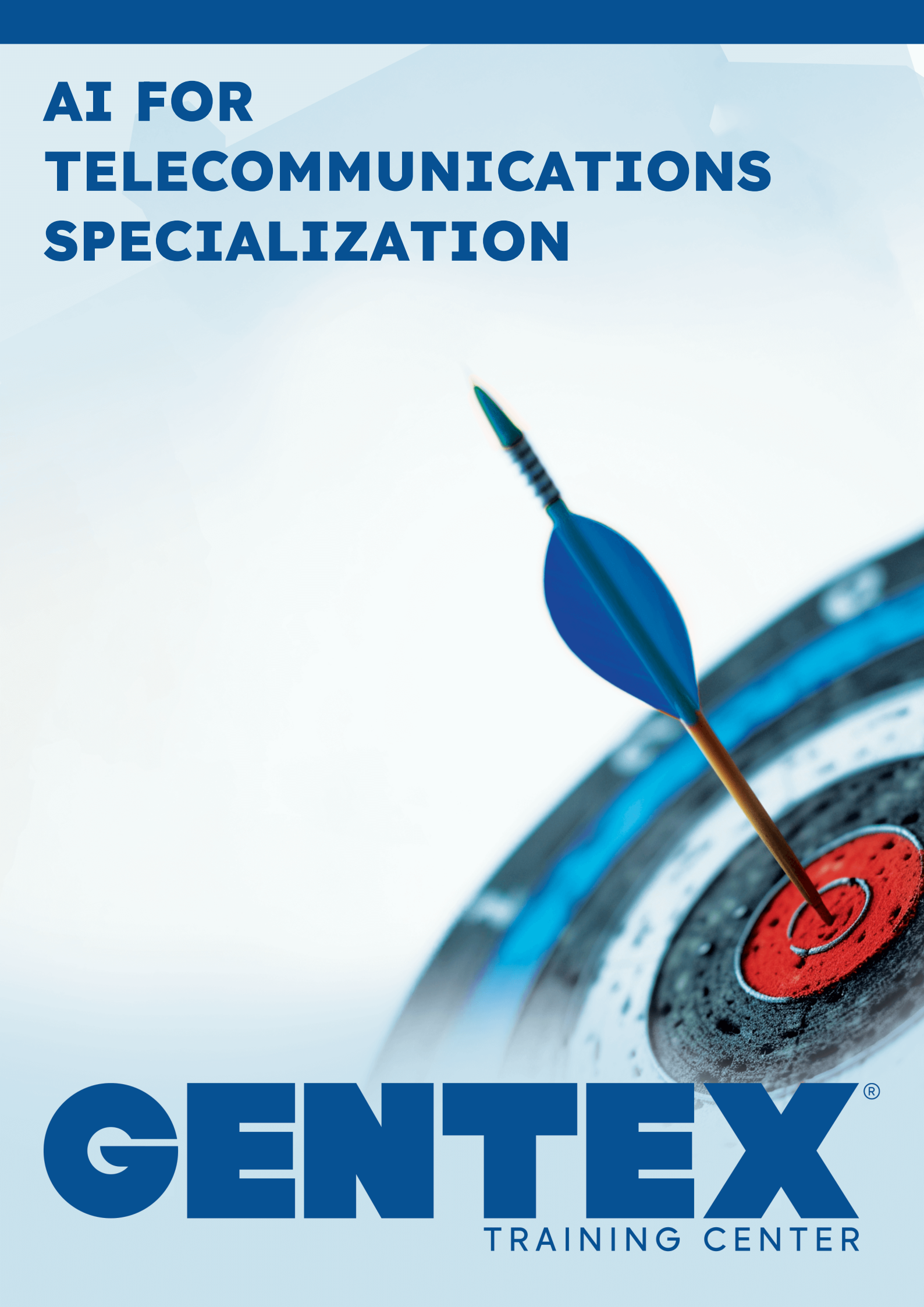
AI FOR TELECOMMUNICATIONS SPECIALIZATION



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Introduction

Telecommunications networks generate large volumes of data from network equipment, customer interactions, connected devices, service platforms, and operational systems. When organizations use this data effectively, they can improve network performance, predict service issues, reduce operating costs, strengthen customer experience, and support faster decisions.

The AI for Telecommunications Specialization course provides a structured understanding of how artificial intelligence and machine learning can support telecom operations, engineering, service delivery, customer management, and business growth. The course connects essential AI concepts with practical telecommunications use cases. Therefore, participants will not study AI as an isolated technology. Instead, they will examine how it can solve real operational and commercial challenges across telecom environments.

Throughout the five-day course, participants will explore how telecom organizations collect, prepare, and analyze data. They will examine AI applications in radio access networks, core networks, transport systems, service assurance, fault management, capacity planning, and customer operations. In addition, the course explains how predictive models can identify possible network failures, forecast traffic demand, detect unusual behavior, and support preventive action.

The program also covers AI-supported network optimization. Participants will learn how intelligent systems can help telecom teams improve resource allocation, manage network congestion, enhance quality of service, and support more efficient use of infrastructure. The course introduces relevant concepts related to 5G analytics, network automation, edge intelligence, and closed-loop operations.

Moreover, participants will examine how natural language processing and generative AI can assist with technical support, knowledge management, incident analysis, customer communication, documentation, and decision support. They will learn how to assess generative AI use cases carefully and how to control risks related to inaccurate output, data exposure, security, and overreliance on automated recommendations.

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The course combines technical understanding with business value. It helps participants connect AI initiatives with telecom priorities, measurable performance indicators, governance requirements, and implementation plans. By the end of the program, participants will be able to identify suitable AI opportunities, evaluate data readiness, define practical use cases, and support responsible AI adoption within a telecommunications organization.

AI for Telecommunications Specialization Course Objectives

This course aims to provide participants with the knowledge, analytical tools, and practical methods required to understand and apply AI within telecommunications environments. By the end of the course, participants will be able to:

- Explain the main concepts of artificial intelligence, machine learning, deep learning, natural language processing, and generative AI.
- Describe the role of data in developing reliable AI solutions for telecom operations.
- Identify suitable AI applications across radio access, core, transport, service, and customer domains.
- Understand how AI can support network planning, monitoring, optimization, and automation.
- Use analytical thinking to define telecom problems that AI can address.
- Explain how predictive models support fault prediction and preventive maintenance.
- Assess how AI can improve network performance, quality of service, and customer experience.
- Recognize the role of AI in traffic forecasting, capacity planning, and resource allocation.
- Examine AI applications in fraud detection, revenue assurance, and unusual behavior analysis.

- Understand the purpose of network analytics functions within modern telecom architectures.
- Explore the use of AI in 5G, edge computing, network slicing, and intelligent operations.
- Evaluate generative AI applications for technical support, reporting, documentation, and knowledge access.
- Identify data quality, privacy, cybersecurity, and integration requirements.
- Distinguish between rule-based automation, predictive AI, generative AI, and agent-based systems.
- Develop clear performance indicators for evaluating AI use cases.
- Assess the operational and financial value of proposed AI initiatives.
- Recognize common reasons why telecom AI projects fail or produce limited results.
- Apply responsible AI principles to telecom use cases and decision processes.
- Develop a practical roadmap for implementing an AI solution in a telecom organization.
- Communicate AI opportunities, risks, and requirements to technical and non-technical stakeholders.

Course Methodology

Gentex Training Center delivers this course through instructor-led explanations, telecom case studies, guided discussions, practical exercises, data interpretation activities, and group workshops. Participants will examine realistic network and customer scenarios, define AI use cases, evaluate implementation risks, and develop an AI adoption roadmap. The methodology focuses on practical understanding, active participation, and direct application within telecommunications environments.

Who Should Take This Course

This course is suitable for:

- Telecommunications engineers and network specialists.

- Radio access network, core network, and transport professionals.
- Network operations center personnel.
- Telecom data analysts and business intelligence professionals.
- IT, cloud, and digital transformation teams.
- Service assurance and quality management professionals.
- Network planning and optimization specialists.
- Customer experience and customer service managers.
- Revenue assurance and fraud management teams.
- Technology project managers and product managers.
- Cybersecurity, risk, compliance, and governance professionals.
- Managers responsible for AI, automation, innovation, or telecom strategy.
- Professionals involved in 5G, Internet of Things, edge, or smart network initiatives.

AI for Telecommunications Specialization Course Outlines

Day 1: Artificial Intelligence Foundations for Telecommunications

- AI, machine learning, deep learning, analytics, and automation concepts.
- Supervised, unsupervised, and reinforcement learning methods.
- Natural language processing and generative AI fundamentals.
- Overview of telecommunications network architecture and AI opportunities.
- Telecom data sources, including alarms, logs, performance data, and customer records.
- Data collection, cleaning, preparation, validation, and quality management.
- AI model training, testing, deployment, and performance measurement.

- Defining a practical AI use case for a telecommunications challenge.

Day 2: AI for Network Planning, Optimization, and Performance

- AI-supported network planning and infrastructure investment decisions.
- Network traffic forecasting and capacity demand prediction.
- Intelligent spectrum, bandwidth, and network resource allocation.
- Radio access network optimization, coverage analysis, and load balancing.
- Mobility management and handover optimization.
- Quality of service and customer experience analysis.
- 5G network analytics, NWDAF, network slicing, and edge AI.
- Energy optimization and AI-supported network performance improvement.

Day 3: Predictive Maintenance, Fault Management, and Automation

- Reactive, preventive, and predictive maintenance approaches.
- Network anomaly detection and equipment failure prediction.
- Alarm correlation, incident prioritization, and root cause analysis.
- Predicting the impact of faults on customers and services.
- AI-supported service assurance and network operations.
- Rule-based automation and closed-loop network automation.
- AI-assisted troubleshooting and technical knowledge retrieval.
- Designing a predictive maintenance use case.

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Day 4: AI for Customers, Revenue, and Fraud Management

- Telecom customer data analysis and customer segmentation.
- Customer needs, demand, and churn prediction.
- Customer retention and personalized service recommendations.
- Customer journey analysis and next-best-action models.
- Virtual assistants, chatbots, and AI-supported customer service.
- Sentiment analysis and complaint classification.
- Fraud detection and unusual usage analysis.
- Revenue assurance, billing error detection, and revenue leakage prevention.

Day 5: Generative AI, Governance, and Implementation Roadmap

- Generative AI and large language model applications in telecommunications.
- AI knowledge assistants for engineering and operations teams.
- Technical document analysis, reporting, and incident summarization.
- Prompt design and retrieval-augmented generation.
- Data privacy, cybersecurity, and information protection.
- Responsible AI, transparency, accountability, and human oversight.
- AI vendor evaluation and build, buy, or partner decisions.
- Developing a telecom AI business case and implementation roadmap.

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Conclusion

By successfully completing the AI for Telecommunications Specialization course, participants will gain a practical understanding of how artificial intelligence can support network operations, service assurance, customer management, revenue protection, and business improvement.

They will be able to identify valuable AI opportunities, assess telecom data requirements, evaluate operational risks, and connect AI initiatives with measurable organizational priorities. Participants will also understand how to approach network automation, predictive maintenance, generative AI, and responsible AI governance in a structured way.

Through practical exercises and telecom-focused case studies, participants will develop the knowledge needed to contribute to AI projects and communicate effectively with engineering, data, business, security, and leadership teams. Gentex Training Center provides this course to help telecommunications professionals make informed decisions and support the responsible adoption of AI across their organizations.

FAQs

Q1 What is the "AI for Telecommunications Specialization" course about?

The AI for Telecommunications Specialization course explains how artificial intelligence, machine learning, analytics, and generative AI can support telecom operations. It covers network planning, optimization, predictive maintenance, service assurance, customer management, fraud detection, automation, and responsible AI implementation.

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Q2 What are the key benefits of the "AI for Telecommunications Specialization" course?

The course helps participants identify practical AI opportunities, assess telecom data requirements, improve network performance, support predictive maintenance, and enhance customer operations. It also develops understanding of AI risks, governance, business value, and implementation planning for telecommunications organizations.

Q3 What skills will I gain from the "AI for Telecommunications Specialization" course?

Participants will develop Telecom AI Use Case Development, Network Optimization and Analytics, Predictive Maintenance and Fault Management, and Responsible AI Governance and Implementation. These skills support practical AI applications across network operations, performance improvement, fault prediction, customer services, and responsible technology adoption.

Q4 What tools, methods, or standards are covered in the "AI for Telecommunications Specialization" course?

The course covers supervised, unsupervised, and reinforcement learning, network analytics, NWDAF, network slicing, edge AI, anomaly detection, predictive models, rule-based and closed-loop automation, generative AI, prompt design, and retrieval-augmented generation (RAG). It also addresses performance indicators, data quality, privacy, cybersecurity, and human oversight.

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Q5 How is the "AI for Telecommunications Specialization" course applied in real-world practice?

The course applies AI to practical telecom challenges such as traffic forecasting, capacity planning, network optimization, fault prediction, anomaly detection, customer churn prediction, fraud detection, revenue assurance, and technical support. Participants also develop AI use cases, evaluate risks, and create practical implementation roadmaps.