

AI+ Healthcare Fundamentals (AIHC)

ID AIHC Price CHF 995.—(excl. VAT) Duration 1 day

Who should attend

- Doctors, Nurses, and Other Medical Professionals: Use AI for better diagnosis and treatment.
- Healthcare Administrators and Managers: Leverage AI for efficient resource allocation.
- Medical Researchers and Scientists: Use AI to improve data analysis and healthcare solutions.
- Data Scientists and AI Specialists: Implement AI to create and execute efficient, AI-driven and streamlined healthcare applications.
- Policy Makers and Regulators: Analyze AI to implement relevant, coherent and holistic healthcare policies and regulations.

This course is part of the following Certifications

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Prerequisites

- Domain Awareness: Basic understanding of the world of healthcare.
- Innovative Mindset: Readiness to think innovatively, generate novel ideas, and effectively utilize AI tools in healthcare.
- Openness to AI: Openness to exploring various aspects of AI in healthcare, including its implications, challenges, and opportunities.
- Motivation to Build Synergies: Strong interest in exploring the integration of AI technologies within the healthcare sector.

Course Objectives

- Gain knowledge of AI technologies and how they are applied to enhance medical imaging, diagnostics, and healthcare operations.
- Learn to use AI tools to improve diagnostic precision and streamline healthcare processes.
- Develop skills in gathering and maintaining high-quality healthcare data for effective predictive analytics and decision-making.
- Explore how AI can be used for remote patient monitoring and managing chronic conditions to enhance overall patient

care.

- Discover methods for leveraging AI to optimize healthcare administration tasks such as scheduling, billing, and resource allocation.
- Understand the ethical implications and regulatory requirements for AI applications in healthcare to ensure compliance and protect patient privacy.

Course Content

Module 1: Introduction to AI in Healthcare

From its conception to its use, AI has changed society and technology. AI's use in healthcare, banking, and transportation shows its revolutionary role in modernizing society and improving efficiency. In the healthcare ecosystem, understanding data types is crucial. AI improves diagnosis, treatment planning, and patient care while resolving data privacy and regulatory compliance issues. This module covers the fundamentals of AI in healthcare, starting with a historical overview and an examination of key technologies like machine learning, deep learning, and neural networks. It highlights AI's transformative impact on improving diagnostic accuracy, personalizing treatment, and optimizing healthcare administration. The module also addresses challenges in integrating AI, including data integrity, privacy concerns, ethical considerations, and regulatory compliance. By understanding these elements, learners will be equipped with the knowledge needed to navigate and leverage AI technologies effectively within the healthcare sector.

Module 2: Data Handling and AI Modeling

Healthcare AI requires data capture and management for data handling and AI modeling. Data storage and management require scalable, secure, and interoperable technologies to ensure data accessibility and regulatory compliance. Medical data preprocessing is necessary for AI modeling. Data scientists can increase a model's ability to learn from data by carefully designing and selecting important characteristics. AI models for healthcare must integrate domain-specific knowledge and ethical implications to meet real-world diagnosis, treatment, and patient care demands. This module examines the essential processes for managing and

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utilizing healthcare data, with a focus on methods for ethical data collection, robust storage solutions, and ensuring data quality. It explores techniques for preprocessing medical data, including managing missing data, normalizing datasets, and feature engineering to enhance AI model performance. Additionally, the module covers the development and validation of AI models specifically designed for healthcare, addressing aspects such as model design, training, tuning, and evaluation to ensure their effective and reliable application in medical settings.

Module 3: AI in Medical Imaging

Advanced AI technologies in medical imaging are improving diagnostic accuracy and efficiency. Innovative picture segmentation and object recognition algorithms are changing medical image analysis, enabling precise diagnosis and therapy planning. These advances demonstrate AI's potential to improve healthcare accuracy and efficiency. AI will most likely further improve diagnostic and treatment planning in radiology and pathology. Medical innovations like personalized treatment and remote patient monitoring will transform healthcare. These advances will change medical imaging, improving patient outcomes and healthcare systems.

This module explores various medical imaging techniques, such as X-ray, MRI, and CT scans, while addressing challenges related to the quality, privacy, and interoperability of medical imaging data. It discusses AI techniques in imaging, with a focus on deep learning models like Convolutional Neural Networks (CNNs) and Generative Adversarial Networks (GANs), and their applications in improving image quality and diagnostic accuracy. The module also covers the integration of AI tools into clinical workflows and anticipates future trends in AI for radiology and pathology, highlighting innovations poised to shape the future of healthcare.

Module 4: AI in Diagnostics and Predictive Analytics

AI-powered diagnostic tools and predictive analytics are changing illness detection, diagnosis, and prevention. Data Bridge Market Research conducted a study revealing that the US healthcare analytics market is expected to reach USD 13.49 billion by 2030 with an estimated CAGR of 10.2% from 2023 to 2030. Healthcare predictive analytics uses AI to predict epidemics and analyze chronic disease risks. These enable preventive public health actions and efficient resource allocation. Predictive insights improve preventive care by identifying high-risk individuals and initiating early interventions.

This module explores the use of AI-powered diagnostic systems to improve disease identification and early detection across various medical specialties. It examines how predictive analytics can forecast disease outbreaks and support real-time analysis for timely interventions and personalized treatment plans. The module also analyzes case studies in oncology and cardiology to demonstrate AI's impact on diagnosis and patient care. Additionally, it addresses challenges such as data heterogeneity and complexity, enhancing preventive care, and overcoming implementation barriers, while emphasizing the importance of continuous learning and model updating.

Module 5: AI in Treatment Planning and Personalized Medicine

AI in treatment planning and personalized medicine is revolutionizing healthcare by personalizing treatments, optimizing drug discovery, and using genetic data for accuracy.

According to an Allied Market Research study, the global personalized medicine market size was estimated at \$300 billion in 2021 and is expected to generate a total revenue of \$869.5 billion by 2031, with a CAGR of 11.2% during the forecast period. AI improves patient outcomes by creating personalized treatment plans that increase efficacy and reduce side effects.

This module explores AI's pivotal role in developing personalized treatment plans and optimizing patient outcomes through machine learning models and reinforcement learning. It addresses ethical considerations in personalized medicine, including data privacy and consent, and examines applications in drug discovery and genetic data analysis. Case studies will highlight successful personalized care approaches, while future advancements in AI-driven medicine will be anticipated. The module also investigates how AI integration with robotic surgery and other technologies can enhance treatment precision and addresses challenges and solutions for effective AI implementation and continuous model updating.

Module 6: AI in Patient Monitoring and Care Management

AI-powered patient monitoring and care management using wearables and the Internet of Things (IoT) is transforming healthcare. However, the widespread adoption of wearable health technology presents problems such as accuracy, privacy, and user acceptance, which are essential for success. AI transforms outpatient services and reduces hospital readmissions, drastically

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changing healthcare delivery.

This module navigates through the role of wearable technologies and IoT in healthcare, emphasizing smart devices for health monitoring and real-time data collection to enable proactive interventions. It explores the benefits and challenges of wearable health tech and investigates technologies that support remote patient monitoring and chronic condition management. The module also assesses how AI transforms outpatient services, enhances patient engagement, and reduces hospital readmissions. Real-world case studies illustrate the impact of remote monitoring on patient outcomes and healthcare delivery.

Module 7: AI in Health Insurance and Healthcare Management

According to Market Research Biz report, the generative AI in health insurance market size is expected to grow at a CAGR of 33.2% during the forecast period from 2023 to 2032. Health insurance and healthcare administration are being transformed by AI to improve operational efficiency, accuracy, and resource allocation. AI's role in health systems will grow in the future. AI's incorporation into health insurance and healthcare administration will transform care quality and delivery as it evolves.

This module explores how AI enhances operational efficiency in health insurance and hospital management. It examines AI applications in detecting and preventing fraud, customizing insurance packages, and optimizing claims processing. Additionally, the module focuses on how AI improves resource allocation, patient flow, and administrative tasks within healthcare settings. The future of AI in health systems will also be discussed, focusing on predictive analytics for resource management, emergency response, and strategic planning to enhance overall efficiency and effectiveness.

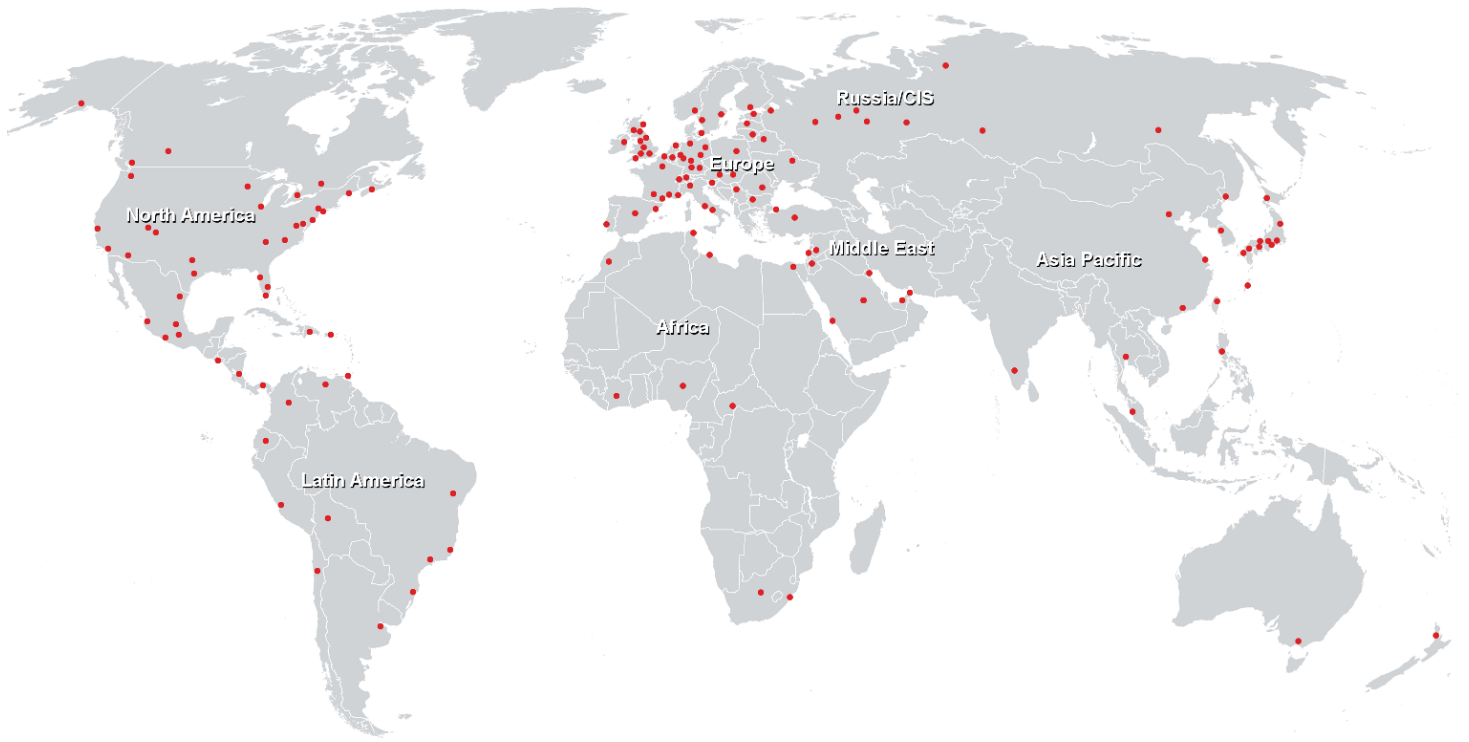
Module 8: Advanced Topics and Future Directions in AI+ Healthcare

AI will transform healthcare with modern technologies and transdisciplinary approaches. Quantum computing, blockchain, and other AI technologies are advancing data processing, security, and decentralized networks for massive healthcare data. Global health projects are also using AI to address healthcare difficulties and promote health equity, showing that AI may improve global health results. Interdisciplinary approaches are essential for healthcare AI's potential.

This module explores cutting-edge innovations and future directions in AI within healthcare. It examines emerging technologies such as quantum computing and blockchain and their potential to transform data processing and security. The module discusses advanced data analytics and global health initiatives to illustrate how AI contributes to healthcare improvements and equity. Additionally, it focuses on integrating bioinformatics with AI, fostering interdisciplinary collaborations, and addressing ethical considerations to ensure responsible and sustainable AI adoption in healthcare.

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Training Centres worldwide



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