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# HMX Short Course - AI in Medicine

## Foundations and Applications in Medical Practice and Research

Explore the foundational principles of artificial intelligence (AI) and its transformative applications in medicine and biomedical research.

AI is reshaping health care, offering unprecedented opportunities to improve patient outcomes, enhance clinical efficiency, and drive innovations in research. This course enables participants to learn directly from leading Harvard Medical School faculty about the technical foundations of AI, including supervised and self-supervised learning and generative modeling. Learners will gain insights into various AI pipelines, and how they can be applied to improve patient diagnosis, clinical workflows, and different types of research, as well as the current regulatory landscape of both traditional machine learning models and generative AI. With the rapid adoption of AI in health care and research, it's now more important than ever to understand the foundations and applications of this exciting field.

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### Participants Will

- Understand the key technical concepts of modern machine learning, including supervised learning, self-supervised learning, and generative modeling.
- Explore how AI is applied to assist with diagnosis, clinical workflows, and biomedical research.
- Learn about the pre-market evaluation and post-market surveillance strategies used to evaluate AI models.
- Understand the different regulatory frameworks for AI in medicine.

### Topics Covered Include

- Key Technical Concepts in Machine Learning: Supervised Learning
- Generative Modeling and Self-Supervised Learning for Text Generation
- Generative Modeling with Diffusion Models for Image Generation
- Deep Dive: Model Architectures
- Pre-market Evaluation of Machine Learning Models
- Deep Dive: Evaluation Metrics for Classification Models
- Applications of AI in Diagnosis
- Applications of AI to Improve Clinical Workflows
- The Role of AI in Biomedical Research
- Post-market Surveillance of Medical AI
- Conversation: Regulatory Aspects of AI in Medicine

HMX Short Courses feature targeted lessons on the latest medical science information and advancements to keep learners up to date.