Generative AI for Clinicians

Course Syllabus

Course Author & Instructor:

Dr. Andres Jimenez, MD, MSEd, MBA, MS

Course Introduction

The healthcare landscape is undergoing a transformation driven by Generative Artificial Intelligence (Gen AI). From automating documentation to refining clinical decision-making, AI-powered tools are already shaping medical practice. Yet, many clinicians remain uncertain about how to critically engage with this technology, assess its risks and benefits, and integrate AI responsibly into patient care.

This course, Generative AI for Clinicians, provides healthcare professionals with a practical, clinician-focused understanding of Generative AI's technical foundations, applications, and challenges. Participants will develop the skills necessary to analyze AI-generated outputs, recognize potential errors, and harness AI to enhance patient outcomes rather than replace clinical judgment.

The course is designed for medical students, nursing students, residents, and practicing clinicians seeking to stay ahead in the AI-driven evolution of healthcare.

Learning Objectives

By the end of this course, participants will:

- Gain a foundational understanding of how Generative AI functions, including deep learning, neural networks, and large language models (LLMs).
- Explore real-world healthcare use cases, from AI-powered diagnostics to clinical decision support systems.
- Develop critical AI literacy to evaluate outputs for hallucinations, biases, and accuracy risks.
- Learn how to apply hypothesis testing and structured prompting to optimize AI-assisted workflows.
- Understand privacy, ethics, and regulatory considerations in AI adoption.
- Gain insights into business models for AI in healthcare and strategies for implementing AI solutions in clinical practice.
- Develop an entrepreneurial perspective, learning how to build AI-driven healthcare innovations while considering regulatory, compliance, and intellectual property factors.

Course Structure

The course consists of seven units, each featuring a lecture by Dr. Jimenez, case scenarios, assigned readings, and assessments.

Unit 1: Foundational Understanding of Generative AI

- Introduction to deep learning models and their role in Gen AI.
- How AI differs from traditional algorithms in healthcare.
- The computational power and infrastructure behind LLMs.
- The competitive landscape of AI development in medicine.

Materials:

- Lecture by Dr. Jimenez
- Case Scenario
- Assigned Readings
- Multiple-Choice Quiz

Unit 2: Healthcare Use Cases

- AI's role in medical imaging, predictive diagnostics, and workflow automation.
- Case studies: AI in radiology, pathology, and cardiovascular risk prediction.
- Challenges and limitations of AI-assisted clinical decision-making.

Materials:

- Lecture by Dr. Jimenez
- Case Scenario
- Assigned Readings
- Multiple-Choice Quiz

Unit 3: Hypothesis Testing for AI in Healthcare

- The role of hypothesis-driven AI evaluation in clinical settings.
- Understanding prompt engineering and structured AI interactions (XML, JSON).
- Strategies for reducing bias and improving AI-generated insights.

Materials:

- Lecture by Dr. Jimenez
- Case Scenario
- Assigned Readings
- Multiple-Choice Quiz

Unit 4: Creating & Capturing Value with Gen AI

- AI's potential to improve efficiency, reduce costs, and enhance patient care.
- Business models for AI-driven healthcare solutions (Healthcare SaaS, AI-Enabled Services).
- The intersection of AI, financial incentives, and clinician adoption.

Materials:

- Lecture by Dr. Jimenez
- Case Scenario
- Assigned Readings

- Multiple-Choice Quiz

Unit 5: Addressing AI Hallucinations & Accuracy Challenges

- How LLMs generate false but convincing information in medicine.
- Techniques for grounding AI responses in factual accuracy.
- Strategies to detect and mitigate hallucinations in clinical AI applications.

Materials:

- Lecture by Dr. Jimenez
- Case Scenario
- Assigned Readings
- Multiple-Choice Quiz

Unit 6: Patient Privacy and AI Ethics in Healthcare

- HIPAA compliance, ambient listening, and AI-generated medical records.
- Ethical concerns in AI-driven clinical decision-making.
- The impact of AI on patient autonomy and equitable healthcare.

Materials:

- Lecture by Dr. Jimenez
- Case Scenario
- Assigned Readings
- Multiple-Choice Quiz

Unit 7: Building an MVP & Intellectual Property (IP) Strategy

- Steps for developing AI-driven healthcare innovations.
- Navigating regulatory requirements (HIPAA, FDA).
- Intellectual property strategies for AI healthcare solutions.
- Avoiding overengineering and technical debt in AI product development.

Materials:

- Lecture by Dr. Jimenez

- Case Scenario
- Assigned Readings
- Multiple-Choice Quiz

About the Course Author: Dr. Andres Jimenez, MD, MSEd, MBA, MS

Dr. Andres Jimenez is a board-certified physician, educator, and serial health-tech entrepreneur dedicated to transforming healthcare through innovation. With a background spanning medicine, public health, education, business, and technology, Dr. Jimenez brings deep expertise in AI applications for healthcare.

Why Learn from Dr. Jimenez?

- **Clinician First:** As a practicing physician, he understands the daily challenges clinicians face with AI-driven tools.
- **Health-Tech Leader:** He has developed AI-driven software used in 3,000+ hospitals and clinics, including leading U.S. health systems, by over 1/3rd of all US physicians.
- **AI & Digital Health Entrepreneur:** He co-founded a revenue cycle AI company, later acquired by CorroHealth, a 6,000-employee firm backed by The Carlyle Group, where he served as CMIO post-acquisition.
- **Academic Leader:** He serves as an Assistant Clinical Professor at Mount Sinai's Department of Environmental and Public Health.
- I**nnovator in Generative AI:** As the Chief Medical Information Officer of HealthPrevent360, Dr. Jimenez leverages Generative AI to scale personalized prevention and early detection in healthcare.
- **Multidisciplinary Background:** An alumnus of Dartmouth, Brown, and Cornell, he holds advanced degrees in medicine, education, business, and public health.

Dr. Jimenez has spent his career at the intersection of medicine and AI, equipping clinicians with the knowledge needed to critically engage with AI rather than passively adopting it. His work has impacted over one-third of all U.S. physicians, making him a leading voice in AI-powered healthcare innovation.

Who Should Take This Course?

This course is ideal for:

- Medical students, nursing students, and residents looking to understand AI's role in modern healthcare.
- Practicing clinicians interested in leveraging AI safely and effectively in patient care.
- Healthcare administrators and policymakers seeking insights into AI regulation, business models, and ethics.
- Medical entrepreneurs and innovators developing AI-driven healthcare solutions.

Course Format & Assessment

- **Self-Paced or Instructor-Led:** Available in both online and university-led formats.
- **Engaging Content:** Simulated case scenarios, lectures, readings, and assessments for active learning.
- **Assessments:** Multiple-choice quizzes to reinforce key concepts.
- **Certification:** Completion certificate for professional development.

Why This Course Matters

The future of medicine is being rewritten in real-time, with Generative AI at its core. Clinicians who develop AI literacy today will be the leaders shaping its integration in healthcare tomorrow.

Will AI empower clinicians to improve care, or will it dictate clinical decisions without proper oversight? The answer depends on us. Let's ensure that clinicians—not just technologists—are leading the AI revolution in healthcare.

Join us in shaping the future of AI-driven medicine.

Contact Information

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