# Artificial Intelligence and Machine Learning in Healthcare

<table>
<thead>
<tr>
<th>Enrollment Period:</th>
<th>Spring 2022</th>
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<tbody>
<tr>
<td>Course Dates:</td>
<td>1/21, 1/28, 2/4, 2/11, 2/18, 2/25 (Fridays, 1:00 – 3:00 pm)</td>
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<tr>
<td>Student Max:</td>
<td>30</td>
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<td>Class Year:</td>
<td>MS1, MS2</td>
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<tr>
<td>Course Director:</td>
<td>Michael Pinsky, MD  <a href="mailto:pinsky@pitt.edu">pinsky@pitt.edu</a></td>
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<td>Student Coordinator:</td>
<td>Amrish Selvam  Email: <a href="mailto:Selvam.Amrish@medstudent.pitt.edu">Selvam.Amrish@medstudent.pitt.edu</a></td>
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<td>Location:</td>
<td>Zoom</td>
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<td>Registration:</td>
<td>Via Amp Up during PEC enrollment period</td>
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<td>Course Description:</td>
<td>The aim of Artificial Intelligence and Machine Learning in Healthcare is to provide a physician specific introduction to artificial intelligence (AI) and machine learning (ML) as well as to provide examples in healthcare where AI/ML will have expanding clinical use. Students will be provided an overview of data science, clinical informatics, and AI/ML concepts to serve as a knowledge base for collaborating with scientists and integrating AI into clinical practice. Applications to healthcare such as predictive analytics, automated imaging interpretation, and natural language processing be provided, as will real-world examples of AI/ML in specific fields of medicine.</td>
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| Objectives:        | 1. To understand the basic concepts of data science, clinical informatics, ML, and AI.  
2. To understand the role of AI/ML in medicine.  
3. To appreciate the applications of AI/ML across different medical specialties.  
4. To appreciate specific examples of AI/ML in biomedical research, medical imaging, acute care medicine, and primary care.  
5. To understand how AI can improve healthcare delivery. |
| Pre-Requisites:    | None |
| Requirements:      | Attend all sessions |
| Texts:             | Good Machine Learning Practice for Medical Device Development |
Course Outline:

**UPSOM Artificial Intelligence and Machine Learning in Healthcare Mini-Elective 2021-22**

Course Director:
Michael R. Pinsky, MD

Participating Faculty:
Michael R. Pinksy, MD
Shandong Wu, PhD
Zaid Siddiqui, MD
Giles Clermont, MD
Yoram Vodovotz, PhD
John Stewart Maier, MD, PhD
Kyle Miller, PhD
Shyam Visweswaran, MD, PhD
Christopher Deible, MD, PhD
Panagiotis Benos, PhD
Douglas Hartman, MD
Kunal Dansingani, MD
Yufei Huang, PhD
Joo Yoon, MD
Rema Padman, PhD

**Session 1: Introduction to Data Science and Clinical Informatics**
Gilles Clermont, Shyam Visweswaran, Christopher Deible

**Session 2: Overview of AI/ML approaches across healthcare**
Shandong Wu, Zaid Siddiqui, Kyle Miller

**Session 3. ML to deconvolute systems biology**
Yoram Vodovotz, Panagiotis Benos

**Session 4: AI in medical imaging**
Shandong Wu, Douglas Hartman, Kunal Dansingani

**Session 5: AI in cancer/oncology**
Zaid Siddiqui, Yufei Huang

**Session 6: AI to improve in-hospital healthcare delivery**
Joo Yoon, Michael Pinsky, John Stewart Maier, Rema Padman