Course Title: Artificial Intelligence: An Introduction to Neural Networks & Deep Learning  
Course Code: SCI 52  
Instructor: RONJON NAG, PHD & SOHILA ZADRAN, PHD

Course Summary:  
Artificial intelligence (AI) is inspired by our understandings of how the human brain learns and processes information and has given rise to powerful AI techniques known as neural networks and deep learning. Much of deep learning in artificial intelligence uses the neuron, the cellular unit of the brain, as its biological inspiration. This course will provide an introductory overview of Artificial Intelligence techniques and place a particular emphasis on neural networks and deep learning. We will discuss how current AI platforms compare and differ with how the brain works, and cover how systems actually “learn” and how to build a neural network. We will also discuss the real-world applications of neural networks. By the end of the course, the aim is for students to have a good intuition of how AI techniques work so as to be able to a) converse with neural network practitioners and companies; b) be able to critically evaluate AI news stories and technologies; c) consider what the future of AI can hold and what barriers need to be overcome with current neural network models.

This introductory course is open to students of all levels. No computer science or programming experience is needed, but at a middle school math level (eg. Simple algebra) is expected, with any further material covered in class.

*Please see course page for full description and additional details.

Grade Options and Requirements:  
- No Grade Requested (NGR)  
  o This is the default option. No work will be required; no credit shall be received; no proof of attendance can be provided.
- Credit/No Credit (CR/NC)  
  o A passing grade (for “Credit”) = 60% attendance  
- Letter Grade (A, B, C, D, No Pass)  
  o Students must attend at least 60% of class sessions, and complete a three-page research report

*Please Note: If you require proof that you completed a Continuing Studies course for any reason (for example, employer reimbursement), you must choose either the Letter Grade or Credit/No Credit option. Courses taken for NGR will not appear on official transcripts or grade reports.

Please contact the Stanford Continuing Studies office with any questions  
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Tentative Weekly Outline:

Week 1: Artificial Intelligence Overview and Neuroscience Basics

Week 2: How does a neural network work?

Week 3: How the brain vs AI processes vision, speech, music

Week 4: Applications: Neural networks for medicine and finance

Week 5: AI ethics if we get closer to “Strong AI” where AI is functionally closer to a human?

Recommended Reading:

- Neural Networks for Complete Beginners: Introduction for Neural Network Programming by Mark Smart (2017)
- Make your own Neural Network: A Gentle Journey through the Mathematics behind Neural Networks and Making your own using Python Computer Language by Tariq Rashid (2016)