



**Course Title:** Artificial Intelligence: Deep Learning, Human-Centered AI, and Beyond  
**Course Code:** SCI 52  
**Instructor:** Ronjon Nag, PhD

## Course Summary:

This introductory course is open to students of all levels. No computer science or programming experience is needed, but 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.*

## Tentative Weekly Outline: Class Time: 7-9pm

- Week 1:** Class structure, Broad overview of AI, machine Learning, Deep Learning  
How does a neural network work? Perceptrons, Neural networks with real numbers. Playing with Tensorflow Playground
  
- Week 2:** Evaluating AI Systems, over and under fitting,  
Advanced neural networks: Convolutional Neural Networks, Playing with Google Collab Neural Networks: Guest Speaker TBD
  
- Week 3:** Correlation and Causal Inference  
Applications: Speech Recognition, handwriting recognition, AI for climate change  
LSTMs, End-To-End Neural Networks,  
Reinforcement Learning  
Generative Adversarial Networks

- Week 4:** Legal Aspects of AI  
Careers in AI  
How to run an AI project  
How to get advantages in AI development
- Week 5:** Natural Language Processing and Understanding:  
Methods, Applications and Frontiers  
AI in healthcare
- Wearables
  - AI for mental health
- Week 6:** AI in Healthcare (cont)  
AI for drug discovery  
AI in longevity  
Brain machine interfaces  
Guest Speaker, CEO, Intellivision, Practical Entrepreneurship and Innovation in AI
- Week 7:** Neuroscience: how do we think the brain works?  
Future of AI, where is strong AI going to come from? Consciousness in AI  
Privacy and ethics  
AI reproducibility  
AI bias
- Week 8:** Boundaries of humanity: intelligence in humans, machines and animals
- Week 9:** Societal implications of AI  
AI Competitiveness  
Investing in AI  
Wrap Up - Q&A

### Required Books/Materials:

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)

Please contact the Stanford Continuing Studies office with any questions  
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## Grade Options and Requirements:

- No Grade Requested (NGR)
  - This is the default option. No work will be required; no credit will be received; no proof of attendance can be provided.
- Credit/No Credit (CR/NC)
  - Attendance in 6 classes, online discussion participation, plus answering of 6 quizzes
- Letter Grade (A, B, C, D, No Pass)
  - Students must attend at least 6 class sessions, participate in online discussions, answer quizzes and complete a 3-10 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.*