Deep Learning Networks are a fundamental tool in modern machine learning/artificial intelligence. They stem from the marriage of robust mathematical models and modern computational capabilities. In this course, we will understand the groundwork for Deep Learning networks. We will also implement codes for deep networks in PyTorch on Google Colab.

Topics:
- Linear and Logistic Regression
- Backpropagation
- Training, Testing and Validation
- Stochastic Gradient Descent
- FeedForward Neural Networks
- Dropout
- Convolution Neural Networks
- Recurrent Neural Networks

Prerequisites (enforced):
- Calculus I, II, III
- Python (CS101 or equivalent)
- Linear Algebra (Math 415)
- Probability (Math 461, IE300 or equivalent)
- Differential Equations (Math 285 or equivalent)
- Junior/Senior Standing

Instructor: Richard Sowers, Professor ISE and Mathematics
https://publish.illinois.edu/r-sowers/

```
class FeedForward(torch.nn.Module):
    def __init__(self):
        super().__init__()
        self.linear1 = torch.nn.Linear(2,2)
        self.linear2 = torch.nn.Linear(2,1)
        self.sigmoid = torch.nn.Sigmoid()

    def forward(self, x):
        out = self.linear1(x)
        out = self.sigmoid(out)
        out = self.linear2(out)
        out = self.sigmoid(out)
        return out
```