1. **Course number and name**
   CptS 434: Neural Network Design and Application

2. **Credits and contact hours**
   3 credits, 3 lecture hours

3. **Instructor’s or course coordinator’s name**
   John Miller

4. **Textbook, title, author, and year**

5. **Specific course information**
   a. **Catalog description:** Neural Network Design and Application
   b. **Prerequisites or corequisites:** CptS 121, CptS 131 or EE 221, STAT 360, Certified major in CptS, CE, EE, or SE.

6. **Specific goals for the course**
   By the end of the course, students will be able to
   ● Apply artificial neural networks (ANNs) to “real-world” problems (1a, 1c).
   ● Compare ANNs to other supervised machine-learning techniques (1d).
   ● Understand ANNs as a non-parametric statistical method of data analysis (1b, 1e)

7. **Brief list of topics to be covered**
   ● Survey of ANN history and applications
   ● Perceptron applications to multivariate linear and classification
   ● Logistic regression
   ● Multilayer perceptron applied to regression and classification
   ● Weight optimization by back propagation
   ● Learning approaches that avoid overfitting
   ● Radial basis function ANN
   ● Optimizing weights by genetic algorithm
   ● Self-organizing maps
   ● Convolution neural networks