EE XXXX — Fundamentals of Speech Recognition
Spring Semester 1998

1997-1998 Catalog Data:	EE XXXX: Fundamentals of Speech Recognition. Lecture 3. Credit 3. Speech Production and Perception; Acoustic Phonetics; Discrete-Time Models of Speech Production; Short-Term Spectral Measurements; Linear Prediction; Dynamic Programming; Hidden Markov Models; Statistical Language Modeling; Neural Networks; An Overview of Commercial Speech Recognition Systems.
Textbook:	J. Deller, et. al., *Discrete-Time Processing of Speech Signals*, MacMillan Publishing Co., 1995, ISBN 0-02-328301-7.
Reference:	L.R. Rabiner and B.H. Juang, Fundamentals of Speech Recognition, Prentice-Hall, 1993, 496 pp., ISBN: 0-13-015157-2.
Coordinator:	Joseph Picone, Associate Professor of Electrical and Computer Engineering
Goals:	To provide the student with a working knowledge of the theory and application of statistical signal processing techniques to the problem of speech recognition and understanding. The course combines lectures on theory with a course project focused on applying a speech recognition system to a state-of-the-art large vocabulary continuous speech recognition problem.

Prerequisites by Topic:

1. Basic probability and statistics.
2. Linear system theory.
3. Signals and system theory.
4. Communications theory.
5. Formal language theory.
5. Exposure to Markov processes and state machines.

EE XXXX — Fundamental of Speech Recognition (Continued)

Topics:

1. Review of Digital Signal Processing and Information Theory (5 classes)
2. Fundamentals of Speech Production and Perception (6 classes)
3. Short-Term Spectral and Temporal Features (6 classes)
4. Dynamic Programming (5 classes)
5. Hidden Markov Models (6 classes)
6. Recognition Architectures (6 classes)
7. Statistical Language Modeling (6 classes)
8. Neural Networks (5 classes)

Computer Usage:

The students work on a semester-long team project that involves building and testing a large vocabulary speech recognition system. Knowledge of C/C++ programming and Unix-based computers is essential. Familiarity with mathematical programming and tools to graphically display/manipulate data is important. Use of multimedia-oriented desktop publishing to prepare final report and presentations is required. Development of web-based demonstrations and presentation of results is also required. Basic familiarity with email, file transfer utilities, and Internet browsers is assumed as students will be expected to interact with web-based materials.

Laboratory: N/A

ABET category content as estimated by faculty member who prepared this course description:

Engineering Science:	1.5 credits	or	50%
Engineering Design:	1.5 credits	or	50%