**Introduction**

As part of its educational mission, The Center for Language and Speech Processing (CLSP), a joint center between Electrical and Computer Engineering and Computer Science, coordinates a full complement of courses dealing with a diverse array of topics in language and speech. It also offers a weekly seminar featuring prominent speakers in speech and language processing. CLSP also has a Masters concentration in **Human Language Technology** open to ECE and CS MSE students. Finally, it is the host of the widely-known CLSP summer research workshop, an event drawing researchers at all levels (faculty to undergraduate) from around the world to conduct intensive research on fundamental problems.

**General Requirements**

1. Satisfactory completion of eight one-semester graduate courses. All require advisor approval. These courses may not include primarily research/independent study courses (e.g. 520.700, 520.800, 520.801, etc.) Seminar courses (e.g. 520.601) and special studies courses may not be used.
   - Five courses must come from the full-time ECE department (520.XXX), and be 600 level or above.
   - Three Additional courses must be level 600 (WSE) / 400 (KSAS) or above.

2. Completion of either (Option 1) two additional graduate courses, or (Option 2) a master’s essay, or (Option 3) a special research project approved by an ECE faculty member.

**Track 1: Speech Processing Systems**

**ECE Courses Relevant to the Track**

*Courses in the ECE Department (not all courses are offered every year):*

- EN.520.647 Information Theory
- EN.520.612 Machine Learning for Signal Processing
- EN.520.635 Digital Signal Processing
- EN.520.645 Audio Signal Processing
- EN.520.646 Wavelets and Filter Banks
- EN.520.648 Compressed Sensing and Sparse Recovery
- EN.520.651 Random Signal Analysis
- EN.520.652 Filtering and Smoothing
- EN.520.666 Information Extraction from Speech and Text
- EN.520.701/702 Current Topics in Language and Speech Processing

**Relevant Courses in Other Departments**

*Computer Science*

- EN.601.675 Machine Learning
- EN.601.765 Machine Learning: Linguistic & Sequence Modeling
- EN.601.775 Statistical Machine Learning

*Applied Mathematics and Statistics*

- EN.553.630 Introduction to Statistics
- EN.553.632 Bayesian Statistics
- EN.553.661 Optimization in Finance
- EN.553.723 Markov Chains
EN.553.735  Topics in Statistical Pattern Recognition

*Biomedical Engineering*
EN.580.691  Learning Theory

**TRACK 2: BIOMIMETIC SENSORY SYSTEMS**

**ECE Courses Relevant to the Track**
*Courses in the ECE Department (not all courses are offered every year):*

EN.520.515  Introduction to Information Processing of Sensory Systems
EN.520.612  Machine Learning for Signal Processing
EN.520.635  Digital Signal Processing
EN.520.645  Audio Signal Processing
EN.520.646  Wavelets and Filter Banks
EN.520.648  Compressed Sensing and Sparse Recovery
EN.520.652  Filtering and Smoothing
EN.520.671  Speech Technologies Reading Group
EN.520.680  Speech and Auditory Processing in Humans and Machines
EN.520.735  Sensory Information Processing

**Relevant Courses in Other Departments**

*Computer Science*
EN.601.675  Machine Learning
EN.601.775  Statistical Machine Learning

*Biomedical Engineering*
EN.580.422  Systems Bioengineering II
EN.580.625  Structure and Function of the Auditory and Vestibular Systems
EN.580.626  Structure and Function of the Auditory and Vestibular Brain
EN.580.630  Theoretical Neuroscience
EN.580.639  Models of the Neuron
EN.580.691  Learning Theory

*Applied Mathematics and Statistics*
EN.553.630  Introduction to Statistics
EN.553.632  Bayesian Statistics

*Neuroscience*
AS.080.620  Theoretical Neuroscience

**ECE Activity in Language and Speech Processing**

**Core Faculty**
- Andreas Andreou
- Mounya Elhilali
- Hynek Hermansky
- Sanjeev Khudanpur

**Research Activity**
- Towards Robust Speech Processing Systems
Zero-Resource Speech Retrieval

Contact Information
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