Course contents include

- Audio representations suitable for content analysis
  - Constant-Q transform, sinusoidal tracks, perceptually-motivated representations
- Audio segmentation and classification methods
  - Feature extraction, “bag of features” classification
- Automatic speech recognition
  - Hidden Markov models, language models, deep neural networks
- Analysis of polyphonic music, sound separation
  - Non-negative spectrogram factorization, multipitch estimation and music transcription
- Target signals: music, speech, environmental audio

Prerequisites

”Mandatory“ (= strongly recommended):
  SGN-14006 Audio and Speech Processing

”Advisable“ (= useful):
  SGN-13006 Introduction to Pattern Recognition and Machine Learning (or SGN-13000 Johdatus hahmontunnistukseen ja koneoppimiseen)

Practical arrangements

- Course homepage: http://www.cs.tut.fi/~sgn24006
- Lectures
  - Tuesdays 12:15-14:00 in TB224
  - Fridays 10:15-12:00 in TB224
  - Annamaria Mesaros, annamaria.mesaros@tut.fi
- Lecture slides will be available as pdf on the course web page
  - Course is not based on any individual textbook. Lectures, lecture notes and exercises will be sufficient for the exam
  - For reference, some textbooks will be mentioned on the lecture slides
- Requirements: exam and project work
- 5 credits
Exercises

- Exercises start one week after the lectures (first exercise 15.3.2017)
- Assistant: Tom Barker
- Contents: math and Matlab exercises related to the lectures
- Exercise: 2 groups
  - Wednesdays 10:15-12:00 in TC217
  - 14:15-16:00 in TC217
- Math problems are to be solved in advance, Matlab exercises are done during the exercises
- Active completion of the exercises and participation in the exercises is credited up to 3 points in the exam (equivalent to one mark)
- Project work will be discussed at the exercises too

Project work

- Implementing an audio signal processing algorithm in Matlab
  - In two-person groups
- Topic will be introduced later during the lectures
- Requirements:
  - Implementing the algorithm
  - Final report
- More detailed instructions will appear on the course home page