



**CS 682 Speech Processing**  
**Fall 2017 / Schedule # 21138**

**Course and Office Hours**

Class meets: Tuesday and Thursday 11:00-12:15 PM [GMCS 305](#)  
Professor Marie Roch, [GMCS 533](#) Tue 5:30-6:20 Thu 3:00-3:50, tel: 619 594 5830  
e-mail: marie●roch a\_t sdsu●edu, office hours posted at <http://roch.sdsu.edu>.

**Course Overview**

You will master machine learning and signal processing skills. We will apply this to recognizing speech and speaker identity, but many of the skills that you will acquire are useful in many contexts such as finance, bioinformatics, control systems, etc.

Upon successful completion of this class, students should be able to:

- Understand feature extraction including automatic discovery of features.
- Have an understanding of human speech production and perception.
- Apply machine learning techniques to a variety of problems including those that require recognizing sequences.
- Be able to write a scientific paper.
- Be well-equipped to understand readings in the speech technologies literature.

**Enrollment Information**

Prerequisites: Data structures, minimal exposure to linear algebra

**Course Materials**

Required materials: Goodfellow, I., Bengio, Y., and Courville, A. (2016). *Deep learning* (The MIT Press, Cambridge, Massachusetts), pp. xxii, 775 pages. Python books if needed (see web site). Headphones/ear buds for listening in lab.

**Course Structure and Conduct**

CS 682 is a lecture-based course. Assignments will primarily use Python and associated libraries. Work can either be done on your own machine or in the computer science lab (GMCS 425).

**Course Assessment and Grading**

I use coarse grading. It is very difficult to justly and systematically determine that one answer is worth  $N$  points and another is worth  $N \pm \epsilon$ . Consequently, points are assigned based upon broad categories that indicate your mastery of the concept:

A+ : Excellent (E)	B : Mostly right (MR)	~40% : Valiant effort (VE)
A : Good (G)	C : Right track (RT)	F : Not much effort

Percentage contribution of assessments to your final grade:

**Exams (40% of grade):** There will be two closed book exams. The exams are non-cumulative, but the second will build on material covered in the first. Generally, I tend to emphasize concepts and you should expect short essay questions in addition to any short answer or quantitative questions. If you cannot attend an exam, contact me before the exam. No make-up exams will be permitted without prior approval.

**Problem sets (30%):** Problem sets consist of questions and programming assignments, and are due at the beginning of class. Any assignments turned in after the beginning of class will be counted late. Late assignments



will be accepted up to one class period after the due date with a penalty of 10% of the possible number of points. The number of problem sets varies from semester to semester, but there are typically five to six problem sets. Questions may be quantitative or qualitative in nature. For qualitative questions you are expected to give responses in grammatically correct complete sentences. For quantitative problems, you must show your work in order to receive credit.

**Labs (25%):** Most labs consist of a programming portion and a written report. Lab reports should be double spaced, use 11 point Times Roman font and have 1.25" margins. Excluding references, lab reports shall not exceed five pages. The purpose of the report is to help you hone your scientific writing skills and provide an opportunity to demonstrate mastery of the material. As such, lab reports are graded on both content and grammar.

**Reading summaries (5%):** You will be asked to read specific articles or sections of books that are not from your primary textbook. Your summary should succinctly describe the work in no more than two double spaced pages with 1.25" margins set in 11 point Times Roman type<sup>1</sup>. In most cases, you will not be able to discuss the entire article; you will need to choose what is most important and summarize it in your own words.

**Note on programs:** Whether as part of a lab or problem set, programs must be well structured and commented. Frequently, students make their lives more difficult by simply writing the program without thinking first. The use of good program design will make your life significantly easier. In addition, an emphasis should be made on making your programs readable. Use meaningful variable names and comment as you write the program rather than adding comments at the end. If you encounter difficulties in your projects, I will assist you provided that you have made a good-faith effort to resolve the problems first. Functionality may be evaluated automatically, be sure to follow specified interfaces and naming conventions.

Good design and structure are expected; programs do not earn grades of A simply because they work. You are not expected to comment every line nor to comment obvious lines of code (e.g. counter = counter + 1), but you must provide enough documentation such that a reasonable programmer can easily follow your code. Failure to do so will result in the program earning a lower number of points.

### Schedule

A tentative schedule for the semester is posted on the course web site. *No early finals will be given, so if you are booking plane tickets do not schedule a date before the final exam (Tues, Dec. 19, 2017 10:30-12:30).*

### Other Course Policies

**Accommodations:** The learning environment should be accessible to all. SDSU provides reasonable accommodations in the following situations:

- **Disability:** If you are a student with a disability and believe you will need accommodations for this class, it is your responsibility to contact Student Disability Services at (619) 594-6473. To avoid any delay in the receipt of your accommodations, you should contact Student Disability Services as soon as possible. Accommodations are not retroactive.
- **Religious and official university activities (e.g., Athletics):** Within the first two weeks of classes, notify your instructor of planned absences for religious or university activities. If scheduling changes occur, immediately notify the instructor.

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<sup>1</sup> If you are a LaTeX user, you can use a report format with double spacing. Some report formats have a draft option which lets you accomplish this.



**Academic Honesty:** You are free to discuss ideas and strategies for approaching problems with others, but students must complete work on their own. Using other people's work in any form (i.e. the web, other students) will result in disciplinary action. Plagiarism is unacceptable and will not be tolerated. You are responsible for understanding plagiarism; the library has a tutorial (<http://library.sdsu.edu/guides/tutorial.php?id=28>). If you have any questions about plagiarism after taking the tutorial, I will be happy to assist you. My standard course of action is to report students whom I believe have cheated or plagiarized to the Center for Student Rights and Responsibilities. In addition to the academic penalty (C- for graduate students), the university may decide upon additional sanctions such as expulsion.

**Classroom policy:** Turn cell-phones off before class and refrain from chatting during class as both disturb the students around you. If you find yourself unable to resist chatting, you will be asked once to be quiet. A second time will result in your being asked to leave for the day.

**Conflicts/Issues:**

Should you have any concerns about the course, please see me during my office hours or make an appointment and we will try to resolve the problem together. If you are not satisfied with the resolution after having discussed the issue with me, you may contact Dr. Leland Beck.