The production of speech is a complicated endeavor. The vocal apparatus comprises several independent articulators, such as the tongue, the lips, and the vocal folds, among others. The movement of all of these articulators must be precisely coordinated with one another in order to create utterances that can be understood by native speakers of a language. While the details of articulator movement are critical for understanding speech production, their actions are not easily deduced since most speech organs are hidden inside the body.

In this seminar, we focus on tongue movement during speech using ultrasound imaging. After learning the basics of vocal tract anatomy and the possible sounds of speech, students will work together with the instructor to develop an experimental question about tongue movement during speech, which will be investigated using ultrasound. Students will collect tongue imaging data in the Phonetics and Experimental Phonology Lab in the Linguistics Department, and will be taught techniques for the analysis of tongue curve data. The data collected by each student will be presented to the rest of the class in order to demonstrate the wide range of variability in speech articulation that can be observed among speakers. Each student will write up their findings in a report.

Students in this class will learn skills such as reading and interpreting primary scientific research, designing a phonetic experiment, analyzing phonetic data, and presenting their findings both in oral and written formats. Since the reading for this class is of a technical scientific nature, reading assignments may seem shorter than in other classes, but it will still require a substantial amount of time to process them.

Course requirements and grading:

There are four components to grading:

- **Participation (15%)**: Comments/questions on the assigned readings to be posted on the discussion forums on NYU Classes
  
  On days when we read primarily phonetic literature, all students must come up with at least 1 comment/question about the assigned papers, to be posted on the discussion forums on NYU Classes by **noon on Wednesdays**. I may use your questions to
develop further portions of that week’s lecture, which takes some time, so late posts to Classes will be penalized.

- **Homework assignments (20%)**: The homework assignments are graded problem sets that are handed out on Thursdays, due the following Thursday. These assignments will be handed in on paper at the beginning of class.

- **Critical review (15%)**: See below. The critical review will be submitted via NYU Classes.

- **Experiment development & write-up**: More information will be provided when the experiment is being designed and carried out. Drafts and the final paper will be submitted via NYU Classes. The paper should be approximately 15 pages long.
  - First draft (10%)
  - Class presentation (15%)
  - Final paper (25%)

**Attendance**

Attendance is critical. Since this class only meets one time a week, students will miss an extensive amount of material if any class session is missed. Moreover, the classes in Section III, Laboratory Methods for Class Project, are designed to teach students the procedures necessary to collect and analyze data, and in-class time will be devoted to these activities. The instructor will not be able to individually teach any student the methodology for carrying out the ultrasound study. Therefore, if any of those classes in particular are missed, the student will be at a distinct disadvantage in succeeding in this class. Any classes that are missed without prior approval—which will only be granted under very exceptional circumstances—will affect the class participation grade.

**Critical review**

- The critical review is an exercise in comparing popular/journalistic writing on linguistics to a scholarly article on the same topic. The point of this assignment is to get students thinking about how scientific writing differs from styles that might be more familiar. Primarily, a critical review is a write-up of 3-4 pages about a scholarly article. This review is not just a summary, but must also contain some critical thinking about the research. For example, students could address questions such as: Do you agree with the author(s)’ conclusions? Did they fail to address any issues that you thought of when reading the paper? Was their methodology adequate for testing their hypotheses? What might be a follow-up study to this research?

- In addition to the assessment of the scientific work, students will also compare the style of the technical article to the journalistic piece. The critical review can address issues such as the structure of the scientific article, and differences in the use of terminology and/or jargon in the two different styles of writing.

- Each student must write their critique individually.
Notes on grading

- No late assignments will be accepted without a note from a doctor, a CAS adviser, or a dean. If you talk to the instructor before the assignment is due, it will be accepted until Monday of the following week. After that, the homework will not be accepted. Once an extension is granted, **there will be no further extensions**.

- Copying anyone's work, including student papers, published articles, or books, is plagiarism. If you are not sure what plagiarism is or why you should avoid it, please read the CAS Statement on Academic Integrity: [http://cas.nyu.edu/page/academicintegrity](http://cas.nyu.edu/page/academicintegrity). Any cases of plagiarism or suspected plagiarism will be discussed with the Director of Undergraduate Studies and possibly the Dean.

- The final paper, which is due by **4pm on Thursday, May 12**, is the write-up of the ultrasound experiment we will be carrying out in class. It will be based on the scientific writing style found in phonetics journals. Reports will be done individually.

- Many of the assignments in this class will be handed in on paper. However, if you are asked to email or upload the assignment, you are responsible for ensuring that the file is perfectly readable and not corrupted. Corrupted files will not be graded under any circumstances.

Writing tutors

In this class, we are fortunate to have help from the Undergraduate Writing Tutors Program. Writing tutors are curious, well-trained peers who provide feedback to students on drafts of writing assignments. Their role is to encourage and challenge students to strengthen their writing and clarify their ideas. Writing tutors are trained to support the aims of the class, learning about the expectations for writing in the class and listening and responding carefully to individual students. While writing tutors are not Teaching Assistants and will not assess papers, they will focus writing conferences on questions that generate clearer writing and stronger thinking about the content. Writing tutors will also look for patterns of grammatical error in student papers, explaining how students can learn to correct these errors. The writing tutors’ main goals are to help students develop their writing and thinking in response to particular assignments and to become better writers over the long term.

Writing tutors take a semester-long practicum to learn to think more deeply about writing and to develop practices for working with peers on writing during individualized conferences. Tutors audit several classes or recitations and read some course materials in the classes where they tutor. Their primary aim is, however, to work with students through a practice-based approach to writing and revising. That is, they will ask questions and work to prompt students to reread, rethink, revise, and craft new writing during conferences.

Students are required to participate in the program for each designated paper assignment, submitting a draft of their paper on time for written feedback and attending a scheduled, 30-minute long, one-on-one conference. Writing tutors should receive complete drafts from
students, not outlines or rough notes. *Late submission of drafts to tutors and missed conferences* are reported to the instructor; a student’s grade on the assignment will be reduced as a consequence.

**Final note**

If a personal situation arises during the semester that may affect your classroom performance, please come talk to me. If you wait until the end of the semester, I won’t be able to help you. I am more likely to be able to address the situation if you speak to me when it happens.

Any student who may require special consideration because of a documented disability should arrange to meet with me soon.

**CLASS SCHEDULE (subject to change)**

**I. PRINCIPLES OF ARTICULATORY PHONETICS**

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<thead>
<tr>
<th>Date</th>
<th>Topic</th>
<th>Reading</th>
<th>Notes</th>
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<tr>
<td>2/25</td>
<td>Vowels of English</td>
<td>How to read a scientific article:</td>
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<td><a href="http://www.owlnet.rice.edu/~cainproj/courses/HowToReadSciArticle.pdf">http://www.owlnet.rice.edu/~cainproj/courses/HowToReadSciArticle.pdf</a></td>
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### 3/3: Observing phonetic events with acoustics
- Critical review draft due to writing tutor

### II. INTRODUCTION TO ULTRASOUND IMAGING IN SPEECH RESEARCH

#### 3/10: Ultrasound Imaging of Speech: Technical issues
- Mtgs with tutors (3/7-3/11)
- Questions for Stone on Classes forum

### III. LABORATORY METHODS FOR CLASS PROJECT

#### 3/24: Hypotheses, methods and stimuli development
- Critical review DUE
- Questions for Westbury on forum

#### 3/31: Ultrasound data collection
- Schedule add'l data collection time during week if necessary

#### 4/7: Ultrasound data analysis

#### 4/14: Data analysis workshop
- Prepare slides for next week

#### 4/21: Student presentations of findings

### IV. ARTICULATORY METHODOLOGIES IN PRACTICE

#### 4/28: Ultrasound Imaging of Speech: Linguistic case studies
- Questions on Classes forum
- First draft of paper due
5/5: Articulatography, electropalatography, airflow, endoscopy


5/12, 4PM: FINAL PAPER DUE