Dr. Elena Borovitskaya,  
office Barton Hall A228  
phone: 215-204-7657  
email: elenab@temple.edu  
Office Hours: T, R 9:00–10:50 am.

The class meets T, R 12:30–1:50 pm in Barton Hall BA140. Any students with special needs due to disability should contact the instructor.

The textbook for the course is *Fundamentals of Sound Science*, First Edition, by Elena Borovitskaya. This book can be bought online, all instructions are given on BlackBoard in the subfolder “Information”.

No mathematics beyond elementary arithmetic will be required.

**Assignments:**

**Homeworks:**
To encourage regular studying and class attendance, there will be several homeworks given. Homeworks will be posted online in our Blackboard website. The Homeworks will contribute 15% of the final grade.

**Experiments:**
Students will carry one experiment involving sound at home or elsewhere and write reports on their results. A list of possible experiments and suggestions for preparing the report may be found at the course web site on Blackboard. Other experiments may be substituted for those on the list, with the instructor’s approval. Students are encouraged to propose experiments on aspects of sound they are particularly interested in. The experiments will count 10% of the final grade. The due date for reports is **Tues, October 14**.

**Literature and Information Search Assignments:**
Students will carry one assignment based completely on Internet search. The list of possible assignments may be found at the course web site of Blackboard. The result of this search will be a report, evaluated by Instructor. Instructor will evaluate writing skills, the volume of analyzed material, as well as critical thinking demonstrated while doing these assignments. To help students in critical evaluation of information, an experienced Librarian will provide a mini-workshop during one of the first meetings of class. This assignment count 15% towards final. Students whose report and research will be found especially interesting by Instructor will have a possibility to make a 7-10 minutes oral presentation for extra points. The due date for reports is **Tues, October 28**.

**Tests:**
The remainder of the final grade (60%) will be based on the two midterm exams (**Tues, September 30; Tues, November 11**) and a final exam (**Thurs, December 11, 10:30 – 12:30**).

The three exams will cover Chapters 1-6, 7-11 and 12-16 of the textbook, respectively. Each of the three exams will contribute equally to the final grade. Warning: Students who miss the final and do not contact the instructor before final grades are turned in will be graded F.
Important dates: last day to withdraw with tuition refund **Mon. Sept 8**, last day to withdraw (without refund) **Tues, October 21**.

The minimum overall course grade required for a given letter grade is as follows:

- A - 85%; A- - 82%; B+ - 79%; B - 75%; C+ - 65%; C - 60%; D+ - 54%; D - 50%
- B- - 70%; C- - 57%

The course begins with a four-week introduction to the fundamental physics of sound waves. With this as a basis, we will then consider human hearing, musical scales and harmony, the production of sound by musical instruments, the human voice and speech sound, architectural acoustics, and the electronic reproduction of sound.

**Reading Assignments**

**Week 1**
- Chapter 1 What is Sound? Appendix 1 The Metric System
- “Information literacy: How to find and evaluate information in the Internet and Libraries” Mini-workshop with Librarian Margaret Janz.
- Chapter 2 Simple Harmonic Motion
- Chapter 3 Waves, Chapter 4 The Sources of the Sound
- Chapter 5 Physical Properties of the Sound
- Chapter 6 Measurements of Loudness
- Chapter 7 Perception of Sound, **September, 30**: EXAM ON CHAPTERS 1-6
- Chapter 8 ABC of Music
- Chapter 9 Fourier Analysis of Simplest Sound Spectra
- Chapter 10 Basic of Percussion Instruments and Normal Modes
- Chapter 11 Normal Modes of Strings
- Chapter 12 The Violin
- Chapter 13 Flutes and Recorders **November, 11**: EXAM ON CHAPTERS 7-11
- Chapter 14 The Reed Family, Chapter 15 The Human Voice
- Chapter 16 Room Acoustics. Review for Final Exam

**FINAL EXAM, December 11, 10:30 -12:30 pm, ON CHAPTERS 12-16**

**Useful references**, all in Paley Library

1. J.Backus, *The Acoustical Foundations of Music*
2. D.E. Hall *Musical Acoustics*
3. R.E. Berg and D.G. Stork, *The Physics of Sound*
4. T.D.Rossing, *The Science of Sound*
5. A.H. Benade, *Fundamentals of Musical Acoustics*
6. H.Helmholtz, *On the Sensations of Tone*
7. C. Hutchins (editor), *The Physics of Music* (reprints from Scientific American)
8. A. Stiller, *Handbook of Instruments*
10. L. Beranek, *Concert and Opera Halls: How They Sound*

Make-up Exam will not be given except for unforeseen situation (illness, emergency etc). Please, notify me prior to the exam and provide me with official note (from a doctor or other officer).

**Policy on Cell Phones:** Cell phones, pagers and beepers must be turned off during class. No texting is permitted during the class session.