

Course Policies and Information

Objective This course explores the mathematical, scientific, and engineering foundations of sound and music. Broad topic areas include the basic concepts of acoustics, the human perception of sound, how various types of musical instruments work, the fundamentals of sound recording and reproduction systems, and the acoustics of performance spaces.

Textbook T. D. Rossing, R. F. Moore, and P. A. Wheeler, *The Science of Sound*, 3rd ed., Pearson, 2002. ISBN-13: 9780805385656.
Supplemental readings will be posted at the course Moodle site.

Web Site <https://www.eg.bucknell.edu/~dkelley/univ213>

Prerequisites None, although the course is meant for students who are fascinated with how things work. Students should have a good understanding and affinity for algebra, trigonometry, and fundamental mathematical concepts such as functions, graphs, and summations.

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Office Hours Times will be announced. Evening office hours, if any, will likely take place via Zoom.

Communication Check your e-mail and the course web site at least **once per day**. Most announcements and course materials will be distributed via the web site or the Moodle site. E-mail might be used to distribute time-sensitive announcements. You are responsible for knowing all assignment due dates and adhering to any policies or updates posted at the web site. You should contact me as soon as possible if you expect to miss a lecture or other scheduled activity.

You may expect prompt, but not instant, responses from me to e-mails, phone messages, and other forms of communication, and I will expect the same from you. I will strive to provide responses within a few hours but no later than 24 hours during the work week. You should not expect responses, nor should I, late at night or on weekends.

Health and Safety Protocols Class and lab meetings are expected to be in person. Remote instruction via the Zoom online platform might be used if, for example, I become ill, I must travel away from campus, or a major weather event makes travel dangerous. In such cases, I will provide as much advance notice as possible. The university will impose or allow remote instruction if an unforeseen crisis warrants it. Any class meetings via Zoom will take place synchronously at their normally scheduled times. Unless recording is taking place (see next section), all students must have their cameras on.

The use of masks in class is likely to be optional but recommended if an outbreak of a highly contagious disease occurs. However, I reserve the right to require everyone in the class to wear properly fitted N-95 or KN-95 masks at all times in the case of a dangerous health crisis. I realize that this policy could be more restrictive than the university's policy, but I must protect a family member who is at high risk of developing serious complications from infection.

Confidentiality Statement

If any class meetings take place on the Zoom online platform, they *might* be recorded for the purpose of making them available to students who miss the material due to absence; however, recordings are not guaranteed. Recordings will be stored securely and will be accessible only to students enrolled in the course. Before a Zoom recording begins, you will be asked to provide your consent to participate. Students who do not provide consent may exit the session and notify me of their decision. The latter group of students may access the recorded session later but are responsible for keeping up with the course material on their own. All students are expected to participate in a Zoom session with their camera on if it is not recorded.

Final Grade Determination

Your final course grade will be determined as shown below, although your weighted exam average must be greater than 50 out of 100 points for you to pass the course. Significant extra credit opportunities are not likely to be provided. Exam dates will be posted at the course web site.

Mandatory Office Hours Visit	3%	
Professional Conduct	5%	
Performance Reflection	10%	
Homework	12%	Weighted equally; lowest score dropped
Project	20%	
Exams #1–#3, Final	3×15%, 5%	Lowest score weighted less than the others

The weightings above might be adjusted and/or alternative assessment methods might be introduced if necessary to account for unusual circumstances, such as a major error on my part in the preparation of an exam or other assignment, a health-related change in instructional mode, or a long-term university closure. Changes will be announced with as much advance notice as possible.

Scores on major assignments will not be discussed until a 24-hour “cooling off” period has passed unless points have been added incorrectly to obtain an overall score. An absolute scale with the following distribution will be used to determine your final course grade.

93–100 A	87–89.9 B+	77–79.9 C+	60–69.9 D
90–92.9 A–	83–86.9 B	73–76.9 C	< 60 F
	80–82.9 B–	70–72.9 C–	

Mandatory Office Hours Visit

You must attend a scheduled office hour session (help session) for at least five minutes at least once after the first week of the semester but before the end of the fifth week. You may attend either an in-person or online session. During the visit, you must discuss something with me that is relevant to the course such as assigned homework problems, an assigned project, a challenging concept, or something that I covered in class that you found interesting. Of course, you are strongly encouraged to visit more often than once! During the visit you must also show evidence that you have access to the textbook. You may bring a physical copy with you, or you may bring up an e-textbook on a computer, smart phone, or tablet. Up to two people may satisfy this requirement simultaneously during a single visit. You will earn only 2.5 points if your visit is during the last scheduled session before the deadline. You may not satisfy this requirement by making an appointment outside regularly scheduled sessions unless you have a verifiable time conflict with every session during the fifth week.

Professional Conduct

Everyone in the classroom must act in a professional manner. Distractions that prevent your classmates from concentrating on instructional activities will not be tolerated. For in-person instruction, these include checking social media, reading newspapers or other noisy print media, web browsing, disruptive eating, excessive talking, chronic tardiness, and other inappropriate behavior. Smart/cell phones, laptops, and other electronic devices other than non-wireless calculators may not be used in class without permission except briefly to take pictures of the whiteboard. Tablet PCs and tablet-like devices may be used to take notes if they are kept flat on the table and are used with a stylus or quiet keyboard, but they will not be allowed if they become a distraction. Please notify me if you need to monitor a device for an important reason such as an ongoing family crisis. Expectations during remote instruction will be similar to those above, and your camera must be on most of the time.

Since part of the educational mission of Bucknell is to prepare you for professional practice, conduct in the classroom and/or online comprises a portion of your course grade. You should act as you would in a professional staff meeting. If you have a valid reason for frequent lateness or for leaving the room or online session during class time, please notify me. Use of prohibited substances and/or possession of associated paraphernalia in class will result in a 1-point drop in the Professional Conduct score per incident and referral to the appropriate dean's office.

Please contact me if you feel that any of these policies should be adjusted. Professional expectations change often, and practices that were once considered unacceptable sometimes later become part of normal work culture. I am willing to modify expectations for good reasons and/or truly changing norms. However, I will not permit practices that distract others from learning.

Performance Reflection

You will be required to attend at least one public musical performance (or other type of performance with prominent acoustical content and/or effects) and submit a written reflection on your experience. The focus will be on the musical instruments or musical techniques or effects used during the performance as informed by knowledge that you have gained from this course. Details of the assignment will be provided early in the semester.

Homework Policies

The primary purpose of homework is to help you engage with the concepts presented in the course at a high level. I encourage you to work on homework in groups and to help each other understand the material within the scope of the "Academic Responsibility" section below. However, the less that you rely on a study group to complete assignments, the more effectively you are likely to learn the material. Ultimately, you need to make sure that you can solve exam problems and complete assigned activities on your own.

Homework assignments will be posted at the course web site, and your completed work must be submitted via the course Moodle site by the indicated deadline. Please follow the formatting guidelines listed below. They are not meant to trip you up or to test whether you can follow instructions. Instead, they help ease the strain on your hard-working grader, and they help ensure that you receive proper credit for your work:

- At the top of the first page, add your name, the course number (UNIV 213), and the homework number. You do not have to use a cover page.
- Add a page number at the top of each subsequent page.
- Arrange problem solutions in the order in which they are listed on the assignment.

- If appropriate, clearly indicate your answers by enclosing them in boxes.
- Write on only one side of the page to prevent “bleed-through.”
- Scan (preferred) or photograph your homework pages and convert them to PDF format. For photos, use a low-resolution setting to minimize the file size. Collect photos into a single PDF file or a word processing file that you then convert to PDF.
- If available, use the black & white setting on your phone or scanner to minimize the file size and improve contrast. Check photos for glare that affects readability.
- Make sure that submitted images have good contrast and are close to 8.5 x 11 inches in size. Moodle does not have a page zoom feature.
- If you use the Goodnotes app, select the “no background” option when you convert to PDF; otherwise, your homework might not be visible in Moodle.
- The file size of your scanned document must be less than 10 MB.

Lack of compliance with one or more of these requirements could result in a score reduction. Sloppy or unreadable work is unacceptable and will receive a score of zero. A homework grader is not likely to be assigned to the course, so each problem will be scored using a coarse rubric based primarily on apparent engagement. Comments will not usually be added, so you should contact me if you would like clarification.

Some of the assigned problems might not be graded. If so, they will be clearly indicated. However, you must study the concepts embodied in *all* problems whether graded or ungraded. Solutions to all problems will be posted at the course Moodle site. It is your responsibility to review them and to rectify any conceptual errors that you might have. You may contact me at any time for assistance.

Project You will have the opportunity to design and construct a simple musical instrument from inexpensive materials. You will be asked to explain your design process and the fundamental principles that underlie how your instrument produces various pitches. Details of the assignment will be provided later in the semester.

Exams There will be three in-semester exams and one final exam. The lowest exam score (including the final exam) will be weighted 5% and the others 15% when the overall course grade is determined. Exams will usually cover only the material introduced since the previous exam, but be aware that some later material builds on earlier material.

Scoring Rubric The following rubric will be used to assign scores to most exam problems. The four numerical columns below apply to total point values of 25, 20, 15, and 10, respectively. For problems with other total point values, scores will be scaled to the nearest whole number. Some problems could be scored using a different rubric or method.

25	20	15	10	Perfect or nearly perfect solution.
23	18	14	9	Minor error; missing or incorrect unit in numerical answer; rounding error; miscopied value.
19	15	11	7	Concept essentially understood, but solution contains a procedural or factual error; concept mostly but not completely understood; incorrect form of key equation; major math error.
13	10	8	5	Concept mostly understood, but solution contains several procedural or factual errors; concept only partially understood.
7	5	4	3	Solution contains a few steps in the right direction but is essentially incorrect; main underlying premise mostly misunderstood.
3	2	2	1	One or two relevant facts are provided, but the solution is essentially incorrect or missing; main underlying premise is missed.

Typically, if more than one type of error that leads to ~75% credit (the “19, 15, 11, 7” category above) is present, then the score will drop to ~50% or ~25% of full credit, as appropriate.

Conflict and Lateness Policies

If you know that you will not be able to complete an assignment by its deadline or to take an exam at its scheduled time, **please notify me at least 48 hours in advance**. If you miss an exam, a major deadline, or other major activity due to illness, injury, or other misfortune, you must contact me as soon as possible. If a health professional or other relevant authority confirms the seriousness of your case, then your absence and/or missed deadline will be excused. In the case of an exam or other major graded activity, a make-up opportunity will be arranged.

Absences or delays due to job interviews, religious observances, participation in performances, participation in varsity athletic competitions, and extraordinary personal opportunities will normally be accommodated. However, in accordance with university policy, incomplete or late work due to personal travel plans under your control (especially around spring recess and final exam week) will not be accommodated. If possible, please provide me with a list of your expected absences early in the semester.

Unexcused absences or missed deadlines (e.g., due to oversleeping) will be handled on a case-by-case basis, probably in consultation with the appropriate dean’s office. If you begin an exam after the start time, you must complete it in the remaining allotted time. However, you may not take the exam if you arrive after the first student has completed it and left the room; this policy includes the final exam. Such a situation is equivalent to missing the exam. If you miss all of an exam due to an unexcused absence, you must notify me as soon as possible. Depending on the reason for the absence, a make-up opportunity of some kind *might* be offered for the first unexcused absence. Further unexcused absences will likely result in a score of zero for the exam or assignment.

A 10% per day score reduction will be imposed for homework, projects, or reflections submitted after the deadline, but homework will not be accepted at all after the solutions have been posted. Adjustments will be made for extenuating circumstances.

Additional policies might be posted at the course web site. If so, they will be announced via multiple methods. You are responsible for knowing and adhering to any posted policies.

Time Commitment

Time allotted to coursework outside of class is guided by Bucknell University’s expectations for academic engagement: “Courses at Bucknell that receive one unit of academic credit [like UNIV 213] have a **minimum** expectation of 12 hours per week of student academic engagement. Student academic engagement includes both the hours of direct faculty instruction (or its equivalent) and the hours spent outside of class on student work.” During some weeks the work load could be greater than average, some weeks less, but it should average **at least** 9 hours per week beyond class time. The total includes time spent on reading, homework, help sessions, exams, and any other activity related to the course. If some aspect of the work seems to require an excessive amount of time, please let me know either directly or anonymously.

Attendance Policy

The decision to attend class either in person or remotely is your responsibility. Although attendance at lectures is not specifically required for this course, I do notice when you are missing. If you struggle in the course, I will point to any absences as a contributing cause. I frequently cover supplemental topics or details in class that do not appear in

the textbook. There could also be occasional in-class exercises. While they might not directly affect your course grade, they could nevertheless help you greatly to comprehend the material. I will not go over course material in detail (i.e., I will not essentially repeat a lecture) for students who miss class without a valid reason such as illness, injury, or an authenticated family crisis.

**Academic
Responsibility**

You must comply fully with the university's academic responsibility policies. All submitted problem solutions must be your own work. Deliverables produced for team-based assignments must also be original. General discussion of solution techniques is okay, but copying full or partial solutions or text, sharing step-by-step instructions for solving a problem, and other forms of plagiarism are not acceptable. It is considered plagiarism if you use text written by an automated system and claim it as your own (e.g., the output from an artificial intelligence tool such as ChatGPT). If these policies are not clear, please contact me or consult Bucknell's "Academic Responsibility" web site: <https://www.bucknell.edu/academics/current-students/academic-responsibility>

Artificial intelligence (AI) tools are proliferating, and it is tempting to use them to solve homework problems, produce written work, etc. It is impossible for me to monitor such usage; therefore, I cannot enforce a prohibition against it. However, you should be aware that if you use such tools, you will not fully develop your ability to solve problems and express ideas nor will you fully develop your technical skill and knowledge. You will not be able to use such tools during exams and presentations. Furthermore, if an AI tool generates an erroneous solution or text and you pass it along as your own, you must accept the resulting grade penalty. As explained above, claiming text generated by an AI tool as your own is considered plagiarism.

**Intellectual
Property**

Exams, homework assignments, exam and homework solutions, supplemental readings, and all other documents shared with the class are my or others' intellectual property and may not be posted online or otherwise shared with people outside the course without my permission. Distributing someone else's intellectual property without their permission is a serious matter.

**Bucknell University
Honor Code**

As a student and citizen of the Bucknell University community:

1. I will not lie, cheat, or steal in my academic endeavors.
2. I will forthrightly oppose each and every instance of academic dishonesty.
3. I will let my conscience guide my decision to communicate directly with any person or persons I believe to have been dishonest in academic work.
4. I will let my conscience guide my decision on reporting breaches of academic integrity to the appropriate faculty or deans.

**Accessibility and
Accommodations**

If you have or develop a medical condition or a documented or suspected learning disability that might affect your work in this course and for which you might require an accommodation, please contact the Office of Accessibility Resources (570-577-1188 or OAR@bucknell.edu) as soon as possible. Moving an exam or obtaining approval for extra time requires coordination with OAR.

Bucknell and I support efforts to maintain mental health. If you are struggling and believe that it could affect your performance in this course, please contact your associate dean or me if you feel comfortable doing so. Working through official channels will enable me to provide resources and support. If you need immediate mental health assistance, call the Counseling & Student Development Center at 570-577-1604; after business hours, call 570-577-1604 and choose option 2.

Statement of Support

I support the right of every student to define their own identity. If you prefer a specific set of pronouns and other forms of address or if you use a name that differs from the one that appears in the university's records, please let me know.

I value and respect all students, staff, and faculty regardless of race, ethnicity, nationality, gender, gender expression or sexual orientation, religion or belief system, economic status, or physical ability, and I hope that you do, too. I encourage you to help build an environment that nurtures learning, growth, inquiry, and the respectful sharing of ideas.

If something related to this course makes you feel uncomfortable, please contact me. If you are not comfortable doing that, then please contact someone else whom you trust. They might include other instructors or your associate dean. Incidents of bias may be reported (anonymously, if you wish) online at:

<https://www.bucknell.edu/life-bucknell/health-wellness-safety/bias-incident-policy>

Advice for Success

I hope that you find this course fun and interesting, but I also hope that you take it seriously. It carries the CCQR and NMLG designations, so you might find the material to be challenging at times. You should attend all lectures and keep up with the reading. Homework assignments will be closely aligned with the assigned reading and could cover material discussed in class as little as two days before the due date. Start working on homework assignments early.

You **must** read the textbook and the supplemental readings. Lectures are not a replacement for the readings but instead are meant to add value to them and explain the more challenging aspects. Students who do not complete assigned readings tend to struggle significantly with the material. The readings fill in the details that I do not have time to cover in class and provide valuable reinforcement of the lecture topics. I know that most textbooks are not as engaging as a bestselling romance novel, but ours is highly regarded in the field; many students can learn from it alone.

Homework and other assigned activities are for your benefit. Take advantage of the opportunity to practice solving problems on your own to improve your learning and retention. Choose active studying over passive studying. Instead of just reading examples and explanations, work through or contemplate at least some of them yourself. Your primary concern should be to understand the concepts and analysis methods presented in the course. Developing valid thought processes that lead to comprehension should be your goal. Arriving at the correct numerical answer is of secondary importance. "It's the journey, not necessarily the destination."

Please contact me if you are struggling with any aspect of the course. If you think that you might be dealing with test anxiety, you should review the resources available on the Exams page at the course web site. They have been prepared by professional counselors and educators and comprise a rich and proven collection of advice for managing test anxiety. You should also consider consulting Bucknell's Counseling & Student Development Center (570-577-1604).

Finally, reflect on this quote from NFL Hall of Fame wide receiver Jerry Rice:

"Today I will do what others won't, so tomorrow I can do what others can't."