

PHYS 102 The Physics of Sound and Music

The Combination PHYS 102/122 has no prerequisites.

You can use this combination either as a lab science or science perspective. Pick One.

Instructor: Michael Ruiz, Ph.D.; Text: Online. **You need Internet access with Google Chrome.**

Chrome is needed for the online apps. No Charge for Course Materials (a \$250 Savings).

August 2018




Monday	Tuesday	Wednesday	Thursday	Friday
		1	2	3
6	7	8	9	10
13	14	15	16	17
20	21 A. What is Sound?	22	23 B. Vibrations	24 Last Day to Drop/Add
27	28 C. Waves	29	30 D. Wave Applications	31

Website: www.uncasound.com or <http://www.opus.unca.edu/sound/>

Our online course website was a top science/technology news story on CNN in 2002.



September 2018

Monday	Tuesday	Wednesday	Thursday	Friday
3 	4 E. Modulation	5	6 F1. Lissajous Figures	7
10	11 F2. Just Diatonic Scale	12	13 G. Strings	14
17	18 H. Pipes	19	20 I. Fourier Analysis	21
24 E1 (A-G) Taken on Your Lab Day	25 J. The Moogerfooger	26	27 K. The Laws of E&M	28





Class Responsibilities and Resources

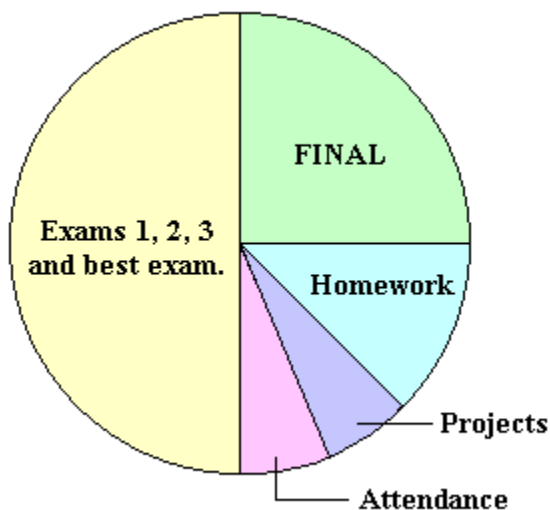
1. **Website:** www.uncasound.com
2. **Text:** It is online. Start reading and keep up. Assignments must be done online and on time.
3. **Notes:** You get access to “Power Notes,” guided sheets you can fill in class.
4. **Homework:** Due 11:59 pm Friday night. You are on your own if you do it after 12 pm Thurs.
5. **Projects:** There are two projects you work on over a period of weeks. Know these due dates.
6. **Office Hours:** I am in RRO 114 or 124D: T & R 11:15-11:45, W 10:45-11:45, 1:00-2:00.
7. **The Forum:** Help your peers out with assignments on our 24/7 online discussion forum.
8. **Attendance (50):** You can miss 2 classes, but there is a bonus (10) for attending all classes. **You may see me to make up the bonus classes.** Also, see me if you miss more than 2 classes.
9. **Official UNCA Travel:** See me 2 weeks prior to make arrangements for a missed class.
10. **Religious Observances:** See me 2 weeks prior to make arrangements for the Observance.
11. **Exam Misses:** Email me ruiz@unca.edu ASAP to schedule a make-up exam.
12. **Extra Credit:** Do questions in the text up until December 3. See Bonus on page October.



October 2018

Monday	Tuesday	Wednesday	Thursday	Friday
1	2 L. Sound Systems	3	4 M. Analog Electronics I	5 First Web Project Due
8 Fall	9 Break 	10	11 N1. Analog Electronics II	12
15 Last Day to Withdraw	16 N2. Digital Electronics	17	18 O. Signal Processing	19
22 E2 (H-N) Taken on Your Lab Day	23 P. Moog Synthesizer I	24	25 Q. Moog Synthesizer II	26
29	30 R. The Ear	31 		

Grading (This course typically has a class grade point average in the 2.6 to 2.8 range).





100	Exam 1 aka E1
100	Exam 2 aka E2
100	Exam 3 aka E3
200	Final aka FN
100	Best Exam Percentage
100	Web Homework (Due Weekly)
50	Two Web Projects (25 points each)
50	Minus 5 per miss after 2 free misses
800	Total (No ± Grades, See Below)

A (740-800) - apply knowledge in new areas
 B (660-739) - apply knowledge in familiar areas
 C (580-659) - apply knowledge in easy areas
 D (500-579) - misconceptions in principles
 F (0-499) - serious gaps in understanding

Bonus and Borderline: If you attend all classes you get a 10-point bonus. If your grade is borderline, I will consider helping you if you come to class, pay attention, put in effort with homework and extra credit. For very close cases I will also look for a strong Final.

November 2018

Monday	Tuesday	Wednesday	Thursday	Friday
			1 S. Perception	2
5	6 T. Audiology	7	8 U. Spectrograms	9
12 E3 (O-U) Taken on Your Lab Day	13 V. Musical Temperament	14	15 W. Woodwind Instruments	16
19	20 X. Brass Instruments	21 <i>Thanksgiving Begins</i>	22 	23 
26	27 Y. String Instruments	28	29 Z. Circle Of Fifths	30 Second Web Project Due



How to Succeed in Sound

1. Time. Reserve at least 2 hours (reading, study, web apps, multimedia, assignments, etc.) for every hour of class. This time is at least 6 hours per week in addition to class time. If you are a full-time student and have a job, you should NOT work more than 15-20 hours per week.

2. Instructor. Drop by weekly during office hours. If you have any problems, come talk to me.

3. Peers. Ask your classmates for help, e.g., at the peer *Forum* on our website and offer help to others. You master the material when you are challenged to explain it to someone else.

Come to every class and take notes. Do not fall behind! Science classes build on previous classes. Use our “Exam Practice”, where you see actual exam questions. If you spend lots of time with “Exam Practice” you will virtually see all the possible questions that can be on your exams. But the best advice is to first carefully study the solutions to old exams.





UNCA is committed to making courses accessible to persons with documented special learning needs. To apply, register with the Office of Academic Accessibility and then see me ASAP.

Make-Up Classes. See me within a week if you would like to make up a missed class.

The Friday Rule: If you wait until the due date (Friday), you are completely on your own, no matter what problems arise, including computer difficulties.

December 2018



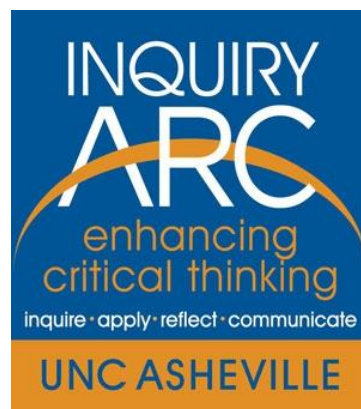
Monday	Tuesday	Wednesday	Thursday	Friday
3 Last Day for Extra Credit	4 UR Symposium	5 Reading Day	6 FINAL (A-Z) Open Time 11:30 - 4:30	7 FINAL (A-Z) Open Time 11:30 - 4:30
10 FINAL (A-Z) Open Time 8:00 - 2:30	11 FINAL (A-Z) Open Time 8:00 - 2:30	12 FINAL (A-Z) Open Time 11:30 - 4:30	13	14
17	18	19	20	21 
24	25 	26 	27	28
31 				

Section 1 (RRO 125): T-R 1:20-2:35 pm. **Section 2 (RRO 125):** T-R 3:15-4:30 pm.
For adverse weather consult your email, the UNCA Home Page, or the radio.

Music in PHYS 102, I-ARC, and CNN



The Physics of Sound and Music incorporates classical music, jazz, and popular music. Our course also includes the study of hearing loss and the psychology of perception. At times, your instructor, also a musician, will demonstrate musical concepts by performance, illustrating a diversity of musical styles.



We follow the *UNCA* I-ARC model: Inquiry (understanding the question or problem at hand), Apply (using the appropriate principle, law, or formula), Reflect (reflecting on the answer to verify its validity), and Communicate (finally giving the answer with confidence with proper units and significant figures).

UNCA-WIDE Important Information

Title IX and Sexual Misconduct. [Note that the legal term “Responsible Employee” appearing below means “Mandatory Reporter.”] Title IX of the Education Amendments of 1972 prohibits sex discrimination against any participant in an educational program or activity that receives federal funds. The act is intended to eliminate sex discrimination in education. Title IX covers discrimination in programs, admissions, activities, and student-to-student sexual harassment, sexual exploitation, interpersonal violence, non-consensual touching, and sexual assault. UNC Asheville’s policy against sexual misconduct extends not only to employees of the university but to students as well. If you encounter unlawful sexual misconduct behavior or gender based discrimination, please talk to any University Responsible Employee (Mandatory Reporter). **All University employees (except Health and Counseling center employees and employed Campus Ministers are considered Responsible Employees (Mandatory Reporters) and are mandated to report incidents to the Title IX Office.**

The Title IX office consists of [Dr. Jill Moffitt](#), UNC Asheville’s Title IX Administrator, who can be reached at [\(828\)232-5658](tel:8282325658); and [Keishea Boyd](#), Assistant Title IX Coordinator, who can be reached at [\(828\)258-7872](tel:8282587872). Individuals may also report anonymously at <https://police.unca.edu/anonymous-report>. For more information regarding Title IX and resources concerning sexual misconduct and its prevention please visit <https://titleix.unca.edu/>.

UNCA Chief of Police: [Chief Eric Boyce](#).

Accommodations and Academic Accessibility. UNC Asheville is committed to making courses, programs and activities accessible to persons with documented special needs. Students requesting accommodations and/or academic adjustments must do so through the [Office of Academic Accessibility](#) and may be required to provide supporting documentation. All information provided will remain confidential. For more specific information please contact the Office of Academic Accessibility at [\(828\)232-5050](tel:8282325050) or academicaccess@unca.edu, visit them in the [OneStop Student Services Center](#) or at their website <https://oaa.unca.edu/>.

Early Alerts. Faculty at UNCA are encouraged to use the university's Early Alert system to communicate with students about their progress in courses. When a faculty member submits an early alert that expresses a concern, the student receives an email from OneStop and meets with the professor to discuss the alert, completing a form as part of the process. It is in the student's best interest to complete the EA process quickly, as students who do so are more likely to earn credit for the course. Failure to complete the EA process (including meeting with the professor and submitting the required form to OneStop) will result in a registration hold; the student won't be able to register for the next semester's classes until they have met with the faculty member and turned in the required form. Questions about the EA system can be directed to [Anne Marie Roberts](#) (amrober1@unca.edu) in OneStop.

Academic Dishonesty. Note that any violations of academic dishonesty (cheating, signing someone else's quiz sheet, etc.) must be reported to the Provost's Office.