

MUCP 4690 / 5690, Fall 2026
Topics in Computer Music: History and Technology of Electronic Music

Time: TuTh, 11:10 am – 12:30 pm

Place: COM MU 2008 and The SoundBox (Willis Library 422)

Instructor: Dr. Andra May (f.k.a. Andrew May)

Web site: <https://unt.instructure.com/courses/151738>

E-mail: andrew.may@unt.edu

Office hours: TBA

Final exam: Thursday, December 10, 10:30 am – 12:30 pm

COURSE DESCRIPTION

This course will develop an historical, technical, and aesthetic context for the art of electronic and computer music, examining the effect of past techniques on design of current systems, and exploring paths not taken. Students will pursue practical hands-on projects with technologies of various periods (or reverse-engineered versions); study the work and ideas of the inventors, engineers, composers and performers who shaped the art of electronic music; and write short essays exploring topics in history and techniques of electronic music. The course will focus on the interactions between design and practice, technology and aesthetics, research and commercial applications; and on the listening and aural analysis skills needed for electronic music practice. The class will focus on creative projects, often collaborative. In addition to reading, writing, and practicum assignments, cumulative midterm and final examinations will also be given.

COURSE OBJECTIVES

Students completing this course will be:

- Knowledgeable about the history and development of music technologies and practices
- Familiar with traditional EA music techniques and their modern counterparts
- Conversant with sounds and aesthetics of EA music from many different times and places
- Skilled in “reduced listening,” technical listening, and aural analysis of sonic textures
- Aware of the historical contexts conditioning current trends in electroacoustic music
- Attuned to creative possibilities outside the historical mainstream

MATERIALS

- Data storage: portable/keychain drives, cloud storage, server space, etc.
- CEMI studio MU2008 access (request access: use the link in Teams or link to <https://forms.office.com/r/Cn90DTmPK1>)
- SoundBox studio (Willis Library 4th floor)

TEXTBOOKS

- All reading, listening, and viewing assignments will be posted on the Canvas site for this course: <https://unt.instructure.com/courses/93424>
- These books will be the source of many of the readings, and may be worth acquiring for your own libraries:
 - Christopher Cox and Daniel Warner (ed's), *Audio culture: readings in modern music*
 - Curtis Roads, *The computer music tutorial*
 - Joel Chadabe, *Electric sound: the past and promise of electronic music*

- Thom Holmes, *Electronic and Experimental Music: Technology, Music, and Culture*
- These two books are excellent resources freely available on line:
 - Jeffrey Hass, *Introduction to Computer Music* <https://cmtext.indiana.edu>
 - Miller Puckette, *Theory and techniques of electronic music*
<http://msp.ucsd.edu/techniques.htm>

READING AND LISTENING ASSIGNMENTS

Students are invited to share commentary and discussion of assigned reading and listening materials via the Canvas site as a way of learning together; these will not be graded. This is an opportunity to learn with and from each other; I will check in from time to time to make sure the conversation is polite and appropriate, and to help clarify things that seem to be presenting confusion or difficulty. Though these assignments are not graded, you will get a lot more out of the course, and likely get better results in your projects and better grades on the examinations if you do them! If things seem too familiar and boring, there will generally be additional resources of possible interest at the end of each assignment.

ESSAYS and PROJECTS

Regularly assignments will involve alternate between essays (either based on research/readings or “thought experiments”) and practical “hands-on” tasks exploring specific technologies and concepts (either individual or group projects). If all goes well, interesting artwork will emerge!

EXAMINATIONS

Midterm and final exams will be cumulative and will cover the materials studied in class in a “scattershot” manner. Anything discussed or played in class is fair game, as is anything in the assigned readings, listenings, and viewings.

GRADING

Student work will be graded and returned within eight “business days.” Work submitted late without explanation or arrangements made will lose credit; work submitted more than a week late will not be given credit, except in extraordinary circumstances.

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|-----------------------|-----|
| • Discussions | 20% |
| • Projects and essays | 40% |
| • Midterm exam | 10% |
| • Final exam | 20% |
| • Class participation | 10% |

COURSE THEMES

Computer music is a nexus of perspectives: engineer, inventor, composer, performer, theorist, listener. Musical goals, technological issues, and aesthetic questions merge as the art develops.

Musical goals

- development of **new practices, instruments, meta- and hyper-instruments**
- **integration** of new opportunities with existing performance situations
- **manipulation of perceived reality** (time, space, identity, physics)

- **construction of new models** of musical behavior
- **machine agency**, degrees and kinds of interaction

Technological issues

- **redirection** of technologies for new musical purposes
- **design for usability**: integration of concepts and technologies with affordances, user feedback, etc.
- levels of **generalization** of techniques, controls, environments, languages
- **backwards compatibility**: new techniques, old interfaces
- **research** and **commercialization**: symbiotic relationships

Aesthetic questions

- psychological and dramatic implications of **disembodied sound**
- **adaptations and cyborgs**: how working with machines changes us as musicians
- who cares if it listens? **machine agency** and its musical implications
- **reinvention and recycling** of timbre, time, style, idea (is novelty still possible?)
- cultural **cross-fertilization** between practices and communities
- thresholds of **cognitive, perceptual, and auditory experience**
- from the **emancipation of all sounds** to the **equivalence of all data**

COURSE PLAN (subject to change!)

- Aug. 18+20 **new instruments lead to new ways of making and hearing sound**
introduction, themes; instrumentality, meta- and hyper-instrumentality
new instruments; properties and opportunities of electronics
essay 1 assigned: instrument design; Aug 21 is last day to add a class!
- Aug. 25+27 **sound broadcast and reproduction transform musical culture**
technologies: tone generator, theremin,
“reduced listening” and other ways to describe of the experience of sound
essay 1 due; project 1 assigned; Aug. 28 is last day to drop a class without a W!
- Sep. 1+3 **sound objects arise from parametric manipulation of stored sound**
the early studio as performance environment; Schaeffer’s frameworks
project 1 due; essay 2 assigned
- Sep. 8+10 **radio and recording studios incubated practices of electroacoustic music**
open reel tape deck basics
editing/splicing basics, looping, multi-tracking, sync playback, bouncing and mixing
essay 2 due; project 2 assigned
- Sep. 15+17 **the studio becomes an instrument by integration and automation of controls**
feedback, more mixer techniques, studio practices, project workflow
voltage control applications in mixing, tape transports, processing and synthesis

- Sep. 22+24 **new control designs question traditional instrument paradigms**
the module-patching model, voltage control synths and simulations
project 2 presentations; essay 3 assigned
- Sep. 29+Oct. 1 **voltage control: integration and unit generator model**
technologies: standard VCS modules, their origins and typical applications
reverse-engineering commercial performance synths into modules
essay 3 due; project 3 assigned
- Oct. 6+8 **the digital revolution: what and why? and Midterm Exam (Oct. 8)**
review of basics of digital audio
recording and filtering in the digital domain
- Oct. 13+15 **digital music data are disembodied, precise, copiable, non-linear**
performing data: MIDI, patch libraries, FM synthesis, samples, delay units
project 3 due; essay 4 assigned
- Oct. 20+22 **the digital studio hides its power behind analog-style interfaces**
digital sampling and DAWs: one technology, two packages for two purposes
techniques using a circular buffer: filter, delay, comb filter, flanger, chorus
essay 4 due; project 4 assigned
- Oct. 27+29 **microsound (whether time or frequency domain) liberates time**
overlap-add harmonizer (alias rotating-head tape harmonizer)
granulation techniques for replay, recomposition, transformation
- Nov. 3+5 **control structures define and delimit techniques and applications**
granulation: randomization, automation, and live control of live sound
project 4 due; essay 5 assigned; Nov. 6 is last day to drop a class with a W!
- Nov. 10+12 **spectra are haunting sound: frequency domain theory and practice**
theory of DFT and FFT; overlap/add STFT and applications
bin-shifting, timbre stamping, frequency domain filtering
- Nov. 17+19 **tracking and interpolating phase: liberation of time, pitch, timbre**
comparing the analog vocoder, the convolution vocoder, and the phase vocoder
phase vocoder techniques: denoising, timestretching, pitch shifting, pitch tracking
essay 5 due; project 5 assigned
- Dec. 1+3 **semester review and final exam preparation**
project 5 due

December 10, 10:30 am – 12:30 pm: final exam

ATTENDANCE

This course moves fast and covers a lot of ground. Regular attendance is expected, and the course will not slow down to help you catch up. If you must miss a class, notify the instructor in advance. Consult the instructor during office hours if you missed any material, either when you were present or absent. Persistent absence will affect your grade for class participation. In case of 6 or more unexcused absences, the instructor reserves the right to summarily assign you a failing grade for the course.

ACADEMIC INTEGRITY

Students caught cheating or plagiarizing will receive a "0" for that particular assignment or exam. Additionally, the incident will be reported to the Dean of Students (Office of Academic Integrity), who may impose further penalty. According to the UNT catalog, the term "cheating" includes, but is not limited to: a. use of any unauthorized assistance in taking quizzes, tests, or examinations; b. dependence upon the aid of sources beyond those authorized by the instructor in writing papers, preparing reports, solving problems, or carrying out other assignments; c. the acquisition, without permission, of tests or other academic material belonging to a faculty or staff member of the university; d. dual submission of a paper or project, or resubmission of a paper or project to a different class without express permission from the instructor(s); or e. any other act designed to give a student an unfair advantage. The term "plagiarism" includes, but is not limited to: a. the knowing or negligent use by paraphrase or direct quotation of the published or unpublished work of another person without full and clear acknowledgment; and b. the knowing or negligent unacknowledged use of materials prepared by another person or agency engaged in the selling of term papers or other academic materials.

See: Academic Integrity Policy <https://policy.unt.edu/policy/06-003>

STUDENT BEHAVIOR

Student behavior that interferes with an instructor's ability to conduct a class or other students' opportunity to learn is unacceptable and disruptive and will not be tolerated in any instructional forum at UNT. Students engaging in unacceptable behavior will be directed to leave the classroom and the instructor may refer the student to the Dean of Students to consider whether the student's conduct violated the Code of Student Conduct. The university's expectations for student conduct apply to all instructional forums, including university and electronic classrooms, labs, discussion groups, field trips, etc.

See: Student Code of Conduct <https://deanofstudents.unt.edu/conduct>

ACCESS TO INFORMATION – EAGLE CONNECT

Your access point for business and academic services at UNT occurs at my.unt.edu. All official communication from the university will be delivered to your Eagle Connect account. For more information, please visit the website that explains Eagle Connect.

See: Eagle Connect <https://eagleconnect.unt.edu>

ODA STATEMENT

The University of North Texas makes reasonable academic accommodation for students with disabilities. Students seeking accommodation must first register with the Office of Disability Access (ODA) to verify their eligibility. If a disability is verified, the ODA will provide you with an accommodation letter. You can now request your Letters of Accommodation ONLINE and ODA will mail your Letters of Accommodation to your instructors. You may wish to begin a private discussion with your professors regarding your specific needs in a course. Note that students must obtain a new letter of accommodation for every semester. For additional information see the Office of Disability Access.

See: ODA <https://disability.unt.edu> (940) 565-4323

DIVERSITY AND BELONGING

UNT values diversity and individuality as part of advancing ideals of human worth, dignity and academic excellence. Diverse viewpoints enrich open discussion, foster the examination of values and exposure of biases, help educate people in rational conflict resolution and responsive leadership, and prepare us for the complexities of a pluralistic society. As such, UNT is committed to maintaining an open, welcoming atmosphere that attracts qualified students, staff, and faculty from all groups to support their success. UNT does not discriminate on the basis of race, color, national origin, religion, sex, sexual orientation, gender identity, gender expression, age, disability, genetic information, or veteran status in its application and admission process, educational programs and activities, employment policies and use of university facilities.

See: Diversity and Inclusion <https://idea.unt.edu/diversity-inclusion>

HEALTH AND SAFETY

Students can access information about health and safety at:
<https://music.unt.edu/student-health-and-wellness>

REGISTRATION INFORMATION

See: <https://registrar.unt.edu/students>

ACADEMIC CALENDAR

See: <https://registrar.unt.edu/registration/fall-registration-guide>

FINANCIAL AID AND SATISFACTORY PROGRESS

Undergraduates

A student must maintain Satisfactory Academic Progress (SAP) to continue to receive financial aid. Students must maintain a minimum 2.0 cumulative GPA in addition to successfully completing a required number of credit hours based on total hours registered. Students cannot exceed attempted credit hours above 150% of their required degree plan. If a student does not maintain the required standards, the student may lose their financial aid eligibility.

Students holding music scholarships must maintain a minimum 2.5 overall cumulative GPA and 3.0 cumulative GPA in music courses.

If at any point you consider dropping this or any other course, please be advised that the decision to do so may have the potential to affect your current and future financial aid eligibility. It is recommended that you to schedule a meeting with an academic advisor in your college or visit the Student Financial Aid and Scholarships office to discuss dropping a course before doing so.

See: Financial Aid <http://financialaid.unt.edu/sap>

Graduates

A student must maintain Satisfactory Academic Progress (SAP) to continue to receive financial aid. Students must maintain a minimum 3.0 cumulative GPA in addition to successfully completing a required number of credit hours based on total registered hours per term. Music scholarships require a 3.5 cumulative GPA. Students cannot exceed maximum timeframes established based on the published length of the graduate program. If a student does not maintain the required standards, the student may lose their financial aid eligibility.

If at any point you consider dropping this or any other course, please be advised that the decision to do so may have the potential to affect your current and future financial aid eligibility. It is recommended you schedule a meeting with an academic advisor in your college,

an advisor in UNT-International or visit the Student Financial Aid and Scholarships office to discuss dropping a course.

See: Financial Aid <http://financialaid.unt.edu/sap>

RETENTION OF STUDENT RECORDS

Student records pertaining to this course are maintained in a secure location by the instructor of record. All records such as exams, answer sheets (with keys), and written papers submitted during the duration of the course are kept for at least one calendar year after course completion. Course work completed via the Canvas online system, including grading information and comments, is also stored in a safe electronic environment for one year. You have a right to view your individual record; however, information about your records will not be divulged to other individuals without the proper written consent. You are encouraged to review the Public Information Policy and the Family Educational Rights and Privacy Act (FERPA) laws and the university's policy in accordance with those mandates. See: FERPA <http://ferpa.unt.edu/>

COUNSELING AND TESTING

UNT's Center for Counseling and Testing has an available counselor whose position includes 16 hours per week of dedicated service to students in the College of Music and the College of Visual Arts and Design. Please visit the Center's website for further information:

See: Counseling and Testing <http://studentaffairs.unt.edu/counseling-and-testing-services>

For more information on mental health issues, please visit:

See: Mental Health Issues <https://speakout.unt.edu>

The counselor for music students is:

Myriam Reynolds

Chestnut Hall, Suite 311

(940) 565-2741

myriam.reynolds@unt.edu

ADD/DROP POLICY

Please be reminded that dropping classes or failing to complete and pass registered hours may make you ineligible for financial aid. In addition, if you drop below half-time enrollment you may be required to begin paying back your student loans. See Academic Calendar (above) for additional add/drop Information.

Drop Information: <https://registrar.unt.edu/registration/fall-registration-guide>

STUDENT RESOURCES

The University of North Texas has many resources available to students. For a complete list, see: Student Resources <https://success.unt.edu/aa-sa-resources>

CARE TEAM

The Care Team is a collaborative interdisciplinary committee of university officials that meets regularly to provide a response to student, staff, and faculty whose behavior could be harmful to themselves or others. See: Care Team <https://studentaffairs.unt.edu/care-team>