

## 2025 Spring INART 55N: History of Electronic Music

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Office Hours: Tuesday/Thursday 4:20-5:30 in Reed 119, or by appointment via Zoom  
Class Meetings: INART 55N: Tuesday/Thursday at 1:35-2:50 in Library 6  
Zoom: <https://psu.zoom.us/my/joelhuntmusic>  
Course Website: <https://psu.instructure.com/courses/2370959>

### **Course Description**

This course explores the intertwined history of electronic music and technology. From the start of the twentieth century through the present day, composers have harnessed advancements in analog electronics, sound recording, telecommunications, digital computing, and artificial intelligence to expand creative boundaries and fuel innovative modes of musical expression. Electronic musical instruments, synthesizers, samplers, computers, and digital audio workstations have become fertile grounds for artistic expression. This course examines electronic music within a multicultural framework, exploring its historical roots, creative processes, aesthetic experiences, and societal values. We will actively engage with electronic music through guided listening activities, analytical exercises, listening journal entries, and creative projects. Our goal is to cultivate the ability 1) to recognize the aesthetic and technical elements of electronic music by ear, and 2) to interpret, evaluate, and contextualize electronic music compositions, genres, and trends within the broader lineage of electronic music history. Success in this course does not require a substantial music background; however, it does require an open mind, an attentive ear, and the ability to articulate what you hear.

### **Course Objectives**

After completion of this course, you should be able to:

- Understand and discuss the historical development of electronic music and the connections between technological advancements, evolving aesthetics, and their impact on artistic expression.
- Analyze and interpret electronic music compositions in terms of their aesthetic and technical elements within different genres, styles, and cultural contexts.
- Critically evaluate electronic music while considering the historical context and societal influences.
- Develop the ability to write thoughtful analyses of electronic music genres, composers, and individual works, utilizing appropriate terminology from electronic music scholarship and criticism.
- Situate contemporary electronic music within its historical lineage while highlighting interconnections with other musical genres, artistic movements, cultural values, and societal influences.

### **Required Materials**

- *Introduction to Computer Music: An Electronic Textbook* by Jeffrey Hass - <https://cmtext.indiana.edu/toc.php>
- *Electronic and Computer Music* by Peter Manning (ISBN 9780199746392). See Canvas for PDFs.

### **Grades**

Attendance/Participation	10%
Reading/Listening Assignments	10%
Writing/Creative Assignments	20%
Midterm Exam	20%
Final Presentation	20%
Final Exam	20%

### **Attendance/Participation (10%)**

You are required to attend every class meeting. Please participate with enthusiasm!

### **Reading/Listening Assignments (10%)**

You are required to complete each reading assignment before class on the date listed on the syllabus. We will use class meetings to exploring additional resources that enhance the material from the textbook. We may not cover all of the textbook content in person, but the information may appear on exams.

### **Writing/Creative Assignments (20%)**

You will complete a series of short written assignments designed to help you develop a vocabulary for describing the sounds, styles, techniques, and structures that you hear in electronic music. You may also have the opportunity to complete alternative creative assignments.

### **Midterm (20%) / Final Exams (20%)**

Midterm and final exams will draw content from the assigned readings, lectures, music excerpts, and guided listening exercises. Exams will include multiple-choice, multiple-select, short-answer, short-essay, and aural-matching questions. Exams will not be accessible after the scheduled exam period (i.e., no makeups).

### **Final Presentation (20%)**

You will prepare a 10-minute research presentation on a contemporary electronic music composer of your choice. Your presentation must include: 1) a **SHORT** biographical overview of the musician's life and music influences, 2) a description of their music style(s), genre(s), and compositional/production techniques, 3) a **comprehensive discussion of how their music relates to the lineage of electronic music history**, and 4) an analysis of one of the composer's characteristic works.

### **Late Work Policy**

I will accept late work, but there will be a 10% penalty for each day of delay. However, I will accommodate you if you have a valid excuse, such as a medical or family emergency, illness, or major life event.

### **Grading Scale**

Highest	Lowest	Letter
100.00 %	93.00 %	A
92.99 %	90.00 %	A-
89.99 %	87.00 %	B+
86.99 %	83.00 %	B
82.99 %	80.00 %	B-
79.99 %	77.00 %	C+
76.99 %	70.00 %	C
69.99 %	60.00 %	D
59.99 %	00.00 %	F

### **Academic Integrity**

Academic integrity refers to a commitment by all members of the University community to refrain from participating in acts of falsification, misrepresentation, or deception. Acts of academic dishonesty go against the fundamental ethical principles of the University community and undermine the value of the work completed by others. Instances of academic dishonesty will be reported to the University, and those found in violation will receive a grade of F.

Violations of academic integrity include but are not limited to:

- **Cheating:** Using crib sheets; using notes or books during a closed book exam.
- **Copying on an assignment or exam:** Looking at other students' exams and copying their answers; copying in a complicit manner with another student; passing answers via notes.
- **Plagiarism:** The fabrication of information and citations; copying from the internet or submitting the work of others from journals, books, articles, and papers; submission of other student's papers (in part or total) and representing the work as one's own; fabricating in part or total, submissions and citing them falsely.

- **ChatGPT:** The use of ChatGPT or any other external AI assistance is strictly forbidden.
- **Acts of aiding:** Facilitating academically dishonest acts; unauthorized collaboration of work; permitting another to copy from an exam; writing a paper for another; collaborating on coursework when prohibited.
- **Unauthorized possession:** Buying or stealing exams; failing to return exams; photocopying exams; any possession of an exam without permission.
- **Submitting previous work:** Submitting a paper or assignment that had been submitted for credit in a prior class without the permission of the instructor.
- **Ghosting or misrepresentation:** Having another student take a quiz or exam in one's place.
- **Altering exams:** Changing incorrect answers and seeking favorable grade adjustments when the instructor returns graded exams for in-class review, asserting that the instructor made a mistake in grading; changing the letter or numerical grade on a test.
- **Computer theft:** Electronic theft of computer programs or other software, data, images, art, or text.

### **Technology Policy**

The **use of mobile phones during class is strictly prohibited**. Taking photos of the whiteboard or projected materials and recording audio during lectures is also prohibited. Failure to adhere to this technology policy without prior approval from the instructor may lead to dismissal from the class. This policy is in place to prevent distractions in the class learning environment. The **use of laptops may be permitted** for note-taking, provided it is done discreetly and does not disrupt the learning environment.

### **Communication**

My goal is to make this course a valuable and positive learning experience for all students. Feel free to drop by my office hours if you have any questions or concerns. **When contacting me via email, include your first and last name and course number in the subject line** (Example: **John Smith INART 55N**). These guidelines will help me quickly identify and prioritize student emails.

### **Religious Holidays and University-Sanctioned Extracurricular Activities**

Students participating in religious holidays or University-sanctioned extracurricular activities that coincide with class meetings will be allowed to make up missed work. However, they must contact me in advance to make arrangements for completing the work.

### **Disability Accommodation Statement**

Penn State welcomes students with disabilities into the University's educational programs. To be considered for reasonable accommodations, visit the Student Disability Resources website (<http://equity.psu.edu/sdr/>) or the Disability Services Office to complete an intake interview and provide documentation (<http://equity.psu.edu/sdr/guidelines>). If your documentation supports the request for reasonable accommodations, Disability Services will issue an accommodation letter. Please share this letter with me and initiate a discussion about the accommodations as early as possible.

### **Counseling and Psychological Services Statement**

Many students face personal challenges or have psychological needs that may impact their academic progress, social development, or emotional well-being. Penn State provides confidential services to help you through difficulties, including individual and group counseling, crisis intervention, consultations, online chats, and mental health screenings. University counseling staff welcomes all students and embraces a philosophy that respects clients' cultural and religious backgrounds while being sensitive to differences in race, ability, gender identity, and sexual orientation.

- Counseling and Psychological Services (<http://senate.psu.edu/faculty/counseling-services-at-commonwealth-campuses/>)
- Penn State Crisis Line (24 hours/7 days/week): 877-229-6400
- Crisis Text Line (24 hours/7 days/week): Text LIONS to 741741

### **Educational Equity/Report Bias Statements**

Penn State is committed to fostering a diverse and inclusive environment for all students, faculty, and staff. If you witness acts of intolerance, discrimination, or harassment please report them to Educational Equity (<http://equity.psu.edu/reportbias/>).

### **Emergency Procedures**

In the event of an emergency, students, faculty, and staff should follow these guidelines:

- Familiarize yourself with evacuation maps posted within the building.
- Know the location of at least two exits and the corresponding evacuation routes from the classroom.
- Exit the building as quickly and calmly as possible using the nearest safe exit.
- Proceed to the building's "Designated Meeting Site" or another location outside the building.
- Do not re-enter the building until public safety officials instruct you to do so.
- Silencing alarms does not necessarily mean that the emergency is over.
- Students requiring assistance during an evacuation should notify the instructor to make arrangements.

### **Schedule:**

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#### **Week 1 (1/14, 1/16)**

Tues. 1/14 Syllabus + Introductions + What is Sound?

- Read: Chapter One: An Acoustics Primer - Sound - due Thurs. 1/16 at 1:35 pm
  - 1. Introduction - [https://cmtext.indiana.edu/acoustics/chapter1\\_intro.php](https://cmtext.indiana.edu/acoustics/chapter1_intro.php)
  - 2. What is Sound? - [https://cmtext.indiana.edu/acoustics/chapter1\\_sound.php](https://cmtext.indiana.edu/acoustics/chapter1_sound.php)
  - 4. What are the characteristics of sound? - [https://cmtext.indiana.edu/acoustics/chapter1\\_waves.php](https://cmtext.indiana.edu/acoustics/chapter1_waves.php)
  - 5. What is frequency? - [https://cmtext.indiana.edu/acoustics/chapter1\\_frequency.php](https://cmtext.indiana.edu/acoustics/chapter1_frequency.php)
  - 7. What is amplitude? - [https://cmtext.indiana.edu/acoustics/chapter1\\_amplitude.php](https://cmtext.indiana.edu/acoustics/chapter1_amplitude.php)
  - 8. What are wave shapes? - [https://cmtext.indiana.edu/acoustics/chapter1\\_shape.php](https://cmtext.indiana.edu/acoustics/chapter1_shape.php)
  - 17. What is Timbre? - [https://cmtext.indiana.edu/acoustics/chapter1\\_timbre.php](https://cmtext.indiana.edu/acoustics/chapter1_timbre.php)
- Write: Assignment 01: Sound Description - due Thurs. 1/16 at 1:35 pm

Thurs. 1/16 What is sound? continued + What is music?

- Write: Assignment 02: Music Description - due Tues. 1/21 at 1:35 pm
  - Read: CH. 01 The Background to 1945 (pg. 3-18) - due Tues. 1/21 at 1:35 pm
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#### **Week 2 (1/21, 1/23)**

Tues. 1/21 Italian Futurists and the Art of Noise + Russolo, Antheil, and Varese

- Listen: Russolo, Antheil, and Varese - due Tues. 1/21 at 11:59 pm
  - "Risveglio di una città" (1913), Luigi Russolo (1885-1947)
  - "Ballet Mécanique" (1923), George Antheil (1900-1959)
  - "Ionisation" (1931), Edgard Varese (1885-1965)
- Write: Assignment 03: Argue for Russolo - due Thurs. 1/23 at 1:35 pm
- Read: Appendices - due Thurs. 1/23 at 1:35 pm
  - Appendix C: Electricity & Electronics Basics for Electronic Musicians - [https://cmtext.indiana.edu/appendices/appendix\\_C.php](https://cmtext.indiana.edu/appendices/appendix_C.php)

Thurs. 1/23 Early Electronic Instruments: Telharmonium, Theremin, Ondes Martenot, and more

- Listen: Rockmore, Hindemith, Messiaen, and Radiohead - due Thurs. 1/23 at 11:59 pm
  - "The Swan" (1976), Clara Rockmore (1911-1998)
  - "Langsames Stück und Rondo für Trautonium" (1935), Paul Hindemith (1895-1963)
  - "Oraison" (1937), Olivier Messiaen (1908-1992)
  - "How to Disappear Completely" (2000), Radiohead (1985-present)

- Write: Assignment 04: Compare Two Early Electronic Instruments - due Tues. 1/28 at 1:35 pm
  - Read: CH. 02 Paris and *Musique Concrète* (pg. 19-38) - due Tues. 1/28 at 1:35 pm
  - Read: Chapter Two: Studio Gear - Microphones - due Tues. 1/28 at 1:35 pm
    - 3. Microphones - [https://cmtext.indiana.edu/studio/chapter2\\_mics.php](https://cmtext.indiana.edu/studio/chapter2_mics.php)
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### Week 3 (1/28, 1/30)

Tues. 1/28 History of Sound Recording + Optical Synthesis

- Listen: McLaren - due Tues. 1/28 at 11:59 pm
  - "Synchrony" (1971), Norman McLaren (1914-1987)

Thurs. 1/30 *Musique Concrète* in Paris and the birth of sampling + Schaeffer and Henry

- Listen: Schaeffer, Varese, and Henry - due Thurs. 1/30 at 11:59 pm
    - "Cinq études de bruits" (1948), Pierre Schaeffer (1910-1995)
    - "Symphonie pour un homme seul" (1950), Pierre Schaeffer (1910-1995) & Pierre Henry (1927-2017)
    - "Poème Électronique" (1958), Edgard Varese (1885-1965)
    - "Etude aux objets" (1959), Pierre Schaeffer (1910-1995)
  - Write: Assignment 05: Describe Schaeffer's Music - due Tues. 2/4 at 1:35 pm
  - Read: CH. 03 Cologne and *Elektronische Musik* (pg. 19-38) - due Tues. 2/4 at 1:35 pm
  - Read: Chapter Four: Synthesis - History, Waveforms, Filters, Vocoding... - due Tues. 2/4 at 1:35 pm
    - 1. A Brief History of Sound Synthesis - [https://cmtext.indiana.edu/synthesis/chapter4\\_synthesis\\_history.php](https://cmtext.indiana.edu/synthesis/chapter4_synthesis_history.php)
    - 2. Synthesis Waveforms - [https://cmtext.indiana.edu/synthesis/chapter4\\_waveforms.php](https://cmtext.indiana.edu/synthesis/chapter4_waveforms.php)
    - 3. Filters - [https://cmtext.indiana.edu/synthesis/chapter4\\_filters.php](https://cmtext.indiana.edu/synthesis/chapter4_filters.php)
    - 10. Phase Vocoding (PV) - [https://cmtext.indiana.edu/synthesis/chapter4\\_pv.php](https://cmtext.indiana.edu/synthesis/chapter4_pv.php)
    - 13. Speech Synthesis and the Channel Vocoder - [https://cmtext.indiana.edu/synthesis/chapter4\\_speech\\_vocoder.php](https://cmtext.indiana.edu/synthesis/chapter4_speech_vocoder.php)
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### Week 4 (2/4, 2/6)

Tues. 2/4 *Elektronische Musik* in Cologne and the birth of the Synthesizer + Speech Synthesis

- Listen: Schoenberg, Webern, and Eimert - due Tues. 2/4 at 11:59 pm
  - "Quintett" Op. 26 (1923), Arnold Schoenberg (1874-1951)
  - "Kantate I" Op. 29 (1938-39), Anton Webern (1883-1945)
  - "Klangstudie II" (1952), Herbert Eimert (1897-1972)
- Write: Assignment 06: *Musique Concrète* vs. *Elektronische Musik* - due Thurs. 2/6 at 1:35 pm

Thurs. 2/6 Serialism, Eimert, and Stockhausen

- Listen: Stockhausen - due Thurs. 2/6 at 11:59 pm
    - "Studie II" (1954), Karlheinz Stockhausen (1928-2007)
    - "Gesang der Junglinge" (1955-56), Karlheinz Stockhausen (1928-2007)
    - "Kontakte" (1958-60), Karlheinz Stockhausen (1928-2007)
  - Write: Assignment 07: Why serialists? - due Tues. 2/11 at 1:35 pm
  - Read: CH. 04 Milan and Elsewhere in Europe (pg. 68-73) - due Tues. 2/11 at 1:35 pm
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### Week 5 (2/11, 2/13)

Tues. 2/11 Electronic Music in Milan (Studio di Fonologia Musicale)

- Listen: Berio, Maderna, and Nono - due Tues. 2/11 at 11:59 pm
  - "Thema: Omaggio a Joyce" (1957), Luciano Berio (1925-2003)

- "Visage" (1961), Luciano Berio (1925-2003)
- "Continuo" (1958), Bruno Maderna (1920-1973)
- "Ricorda cosa ti hanno fatto in Auschwitz" (1965), Luigi Nono (1924-1990)
- Write: Assignment 08: Why phonemes? - due Thurs. 2/13 at 1:35 pm

Thurs. 2/13 UK (BBC Radiophonic Workshop) + EMS

- Listen: Derbyshire, Cary, and Zinovieff - due Thurs. 2/13 at 11:59 pm
    - *Doctor Who* theme (1963), Ron Grainer & Delia Derbyshire (1937-2001)
    - "Trios for Synthesizer VCS3 and turntables" (1971), Tristram Cary (1925-2008)
    - "Chronometer" (1971), Harrison Birtwistle (1934-2022) & Peter Zinovieff (1933-2021)
    - "Nonet" (1979) for computer, Tristram Cary (1925-2008)
  - Write: Assignment 09: Describe Derbyshire's Role at the BBC - due Tues. 2/18 at 1:35 pm
  - Read: CH. 05 America (pg. 74-100) - due Tues. 2/18 at 1:35 pm
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## Week 6 (2/18, 2/20)

Tues. 2/18 America 1: Bebe & Louis Barron, Cage, Ussachevsky, and Luening

- Listen: Cage, Ussachevsky, Luening, and Barron - due Tues. 2/18 at 11:59 pm
  - "Imaginary Landscape No. 5" (1951-2), John Cage (1912-1992)
  - "Sonic Contours" (1952), Vladimir Ussachevsky (1911-90)
  - "Low Speed" (1952), Otto Luening (1900-96)
  - "Williams Mix" (1953), John Cage (1912-1992)
  - Forbidden Planet (1956), Bebe Barron (1927- 2008) & Louis Barron (1920-1989)
- Write: Assignment 10: Cage Controversy/Influence - due Thurs. 2/20 at 1:35 pm

Thurs. 2/20 America 2: Bell Labs + Columbia-Princeton EMC + Canada + Electric Pianos & Guitars

- Listen: Le Caine, Babbitt, and Wourinen - due Thurs. 2/20 at 11:59 pm
    - "Dripsody" (1955), Hugh Le Caine (1914-77)
    - "Vision and Prayer" (1961), Milton Babbitt (1916-2011)
    - "Ensemble for Synthesizer" (1964), Milton Babbitt (1916-2011)
    - "Time's Encomium" (1969), Charles Wuorinen (1938-2020)
  - Write: Assignment 11: Le Caine's "Dripsody" (1955) - due Tues. 2/25 at 1:35 pm
  - Read: CH. 06 The Voltage-Controlled Synthesizer (pg. 101-134) - due Tues. 2/25 at 1:35 pm
  - Read: Chapter Four: Synthesis - Voltage-Controlled Synthesizer - due Tues. 2/25 at 1:35 pm
    - 4. Analog Synthesis Concepts - [https://cmtext.indiana.edu/synthesis/chapter4\\_synthesis\\_concepts.php](https://cmtext.indiana.edu/synthesis/chapter4_synthesis_concepts.php)
    - 5. Envelopes and Gates - [https://cmtext.indiana.edu/synthesis/chapter4\\_envelopes.php](https://cmtext.indiana.edu/synthesis/chapter4_envelopes.php)
    - 6. Patches: The Basic Patch - [https://cmtext.indiana.edu/synthesis/chapter4\\_patches.php](https://cmtext.indiana.edu/synthesis/chapter4_patches.php)
    - 7. Patches: Sub-audio Rate Modulation - [https://cmtext.indiana.edu/synthesis/chapter4\\_modulation.php](https://cmtext.indiana.edu/synthesis/chapter4_modulation.php)
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## Week 7 (2/25, 2/27)

Tues. 2/25 Voltage-Controlled Synthesizer 1: Harald Bode, Robert Moog, Wendy Carlos

- Listen: Carlos, The Beatles, ELP, and Summer - due Tues. 2/25 at 11:59 pm
  - "Switched-On Bach" (1968), Wendy Carlos (1939-)
  - *Abbey Road* (1969), The Beatles (1960-1970)
  - "Lucky Man" (1970), Emerson, Lake and Palmer (1970-2010)
  - *Clockwork Orange* (1971), Wendy Carlos (1939-)
  - "I Feel Love" (1977), Donna Summer (1948-2012)

Thurs. 2/27 Voltage-Controlled Synthesizer 2: Buchla, Subotnick, Aurelia Smith, & Ciani; Eurorack Modules

- Listen: Subotnick, Ciani, Smith, Cortini, Devine, and more - due Thurs. 2/27 at 11:59 pm

- *Silver Apples of the Moon* (1967), Morton Subotnick (1933-)
  - *Buchla Concerts* (1975), Suzanne Ciani (1946-)
  - *Existence in the Unfurling* (2017), Kaitlyn Aurelia Smith
  - Excerpts from Alessandro Cortini, Deadmau5, Richard Devine, and Sylvan Esso
  - Write: Assignment 12: Subotnick vs. Carlos - due Tues. 3/4 at 1:35 pm
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## Week 8 (3/4, 3/6)

Tues. 3/4 Guest Workshop: Jake Lehotsky from Jake's Custom Shop, Reed Union Building TBA

- No Reading Assignment - Study for Midterm

Thurs. 3/6 Midterm Exam [in class] - due Thurs. 3/6 at 2:50 pm

- Read: Excerpts from "Minimal Music, Maximal Impact" by Kyle Gann - due Tues. 3/18 at 1:35 pm
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## Spring Break (3/9 - 3/16) No Class!

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## Week 9 (3/18, 3/20)

Tues. 3/18 Minimalism: San Francisco Tape Music Center

- Listen: Reich, Lucier, Young - due Tues. 3/18 at 11:59 pm
  - "Come Out" (1966), Steve Reich (1936-)
  - "Pendulum Music" (1968), Steve Reich (1936-)
  - "I Am Sitting in a Room" (1969), Alvin Lucier (1931-)
  - "Dream House" (1978), La Monte Young (1935-)

Thurs. 3/20 Minimalism: Music for Tape, Live Electronics, Speech Melody

- Listen: Johnson, Reich, ter Veldhuis - due Thurs. 3/20 at 11:59 pm
    - "John Somebody" (1982), Scott Johnson (1952-)
    - "Different Trains" (1988), Steve Reich (1936-)
    - "Body of Your Dreams" (2003), Jacob ter Veldhuis (1951-)
  - Write: Assignment 13: Compare Examples of Speech Melody - due Tues. 3/25 at 1:35 pm
  - Read: Chapter Five: Digital Audio - due Tues. 3/25 at 1:35 pm
    - 1. Digital Audio Overview - [https://cmtext.indiana.edu/digital\\_audio/chapter5\\_overview.php](https://cmtext.indiana.edu/digital_audio/chapter5_overview.php)
    - 2. Binary Numbers - [https://cmtext.indiana.edu/digital\\_audio/chapter5\\_binary.php](https://cmtext.indiana.edu/digital_audio/chapter5_binary.php)
    - 3. Samples and Sampling - [https://cmtext.indiana.edu/digital\\_audio/chapter5\\_sample.php](https://cmtext.indiana.edu/digital_audio/chapter5_sample.php)
    - 4. Sample Rates: The Nyquist Frequency and Aliasing - [https://cmtext.indiana.edu/digital\\_audio/chapter5\\_nyquist.php](https://cmtext.indiana.edu/digital_audio/chapter5_nyquist.php)
    - 5. Sampling Rates - [https://cmtext.indiana.edu/digital\\_audio/chapter5\\_rate.php](https://cmtext.indiana.edu/digital_audio/chapter5_rate.php)
  - Read: CH. 10 The Foundations of Computer Music (pg. 181-196) - due Tues. 3/25 at 1:35 pm
  - Read: Chapter Four: Synthesis - Computer Music - due Tues. 3/25 at 1:35 pm
    - 14. A Digital Synthesis Language Sampler - [https://cmtext.indiana.edu/synthesis/chapter4\\_synth\\_languages.php](https://cmtext.indiana.edu/synthesis/chapter4_synth_languages.php)
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## Week 10 (3/25, 3/27)

Tues. 3/25 Digital Audio + Computer Music 1: Mathews, Tenney, & Risset

- Listen: Mathews, Tenney, and Risset - due Tues. 3/25 at 11:59 pm
  - "Bicycle Built for Two" ("Daisy Bell"), Max Mathews (1926-2011)
  - "Numerology" (1960), Max Mathews (1926-2011)

- "Phases (For Edgar Varèse)" (1963), James Tenney (1934-2006)
- "Ergodos II (for John Cage)" (1964), James Tenney (1934-2006)
- "Computer Suite for Little Boy" (1968), Jean-Claude Risset (1938-)
- Write: Assignment 14: Tenney and Cage - due Thurs. 3/27 at 1:35 pm
- Read: CH. 12 The Microprocessor Revolution (pg. 217-244) - due Thurs. 3/27 at 1:35 pm
- Read: Chapter Four: Synthesis - FM, AM, RM, & Granular - due Thurs. 3/27 at 1:35 pm
  - 8. Principles of Audio-rate FM Synthesis - [https://cmtext.indiana.edu/synthesis/chapter4\\_fm.php](https://cmtext.indiana.edu/synthesis/chapter4_fm.php)
  - 9. Audio-rate Amplitude Modulation (AM) and Ring Modulation (RM) - [https://cmtext.indiana.edu/synthesis/chapter4\\_am\\_rm.php](https://cmtext.indiana.edu/synthesis/chapter4_am_rm.php)
  - 12. Granular Synthesis and Granulation of Sampled Sound - [https://cmtext.indiana.edu/synthesis/chapter4\\_granular.php](https://cmtext.indiana.edu/synthesis/chapter4_granular.php)

Thurs. 3/27 Computer Music 2: Chowning & FM Synthesis + Intro to Granular Synthesis

- Listen: Chowning and Xenakis - due Thurs. 3/27 at 11:59 pm
    - "Stria" (1977), John Chowning (1934-)
    - "Analogique A-B" (1958/59), Iannis Xenakis (1922-2001)
  - Read: CH. 13 The Characteristics of Digital Audio (pg. 245-262) - due Tues. 4/1 at 1:35 pm
  - Read: Chapter Four: Synthesis - Convolution - due Tues. 4/1 before class
    - 11. Convolution: a form of cross-synthesis [https://cmtext.indiana.edu/synthesis/chapter4\\_convolution.php](https://cmtext.indiana.edu/synthesis/chapter4_convolution.php)
    - Do you understand IR Convolution Reverbs? <https://www.youtube.com/watch?v=BLKWY-U6iQY>
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**Week 11 (4/1, 4/3)**

Tues. 4/1 Computer Music III: Barry Truax, Curtis Roads, and Horacio Vaggione + Digital Synths & Samplers

- Listen: Truax, Roads, and Vaggione - due Tues. 4/1 at 11:59 pm
  - "Riverrun" (1986), Barry Truax (1947-)
  - "Half Life" (1999), Curtis Roads (1951-)
  - "Preludes Suspendus III" (2009), Horacio Vaggione (1943-)
- Write: Assignment 15: Granular Comparison - due Thurs. 4/3 at 1:35 pm
- Read: CH. 14 The Development of the MIDI Protocol (pg. 263-278) - due Thurs. 4/3 at 1:35 pm
- Read: Chapter Three: MIDI - due Thurs. 4/3 at 1:35 pm
  - 1. MIDI Overview and History - [https://cmtext.indiana.edu/MIDI/chapter3\\_MIDI.php](https://cmtext.indiana.edu/MIDI/chapter3_MIDI.php)
  - 2. MIDI Hardware Specification - [https://cmtext.indiana.edu/MIDI/chapter3\\_midi hardware.php](https://cmtext.indiana.edu/MIDI/chapter3_midi hardware.php)
  - 3. MIDI Data Format: Message Types - [https://cmtext.indiana.edu/MIDI/chapter3\\_midi\\_data\\_format.php](https://cmtext.indiana.edu/MIDI/chapter3_midi_data_format.php)
  - 4. MIDI Data Format: Channel Voice Messages - [https://cmtext.indiana.edu/MIDI/chapter3\\_channel\\_voice\\_messages.php](https://cmtext.indiana.edu/MIDI/chapter3_channel_voice_messages.php)

Thurs. 4/3 Digital Synthesizers & Samplers continued + MIDI

- Listen: Synclavier Examples - due Thurs. 4/3 at 11:59 pm
  - *Music for Synclavier and Other Digital Systems* (1978), Jon Appleton (1939-2022)
  - *Xenon* (1980), Suzanne Ciani (1946-)
  - "Mister Heartbreak" (1984), Laurie Anderson (1947-)
  - *The Black Page* (1987), Frank Zappa (1940-1993)
- Listen: Fairlight CMI Examples - due Thurs. 4/3 at 11:59 pm
  - *Shock the Monkey* (1982), Peter Dinklage (1950-)
  - *AEIOU Sometimes Y* (1983), EBN-OZN
  - *Bouncing Off the Satellites* (1986), B-52s (1976-present)
- Listen: Yamaha GS 1 Examples - due Thurs. 4/3 at 11:59 pm
  - *Africa* (1982), Toto (1977-present)
  - *Human Nature* (1982), Michael Jackson (1958-2009)
  - *All Night Long* (1983), Lionel Richie (1949-)



- Listen: Roland Juno 6 Examples - due Thurs. 4/3 at 11:59 pm
    - Sweet Dreams (1983), Eurythmics (1980-2005)
    - Time After Time (1983), Cyndi Lauper (1953-)
    - *Take On Me* (1985), A-ha (1982-present)
  - Write: Assignment 16: Advantages of Digital Synths and Samplers - due Tues. 4/8 at 1:35 pm
  - Read: CH. 09 Rock and Pop Electronic Music (pg. 168-180) - due Tues. 4/8 at 1:35 pm
  - Final Project - Step 1: Claim a topic - due Fri. 4/11 at 11:59 pm
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## Week 12 (4/8, 4/10)

Tues. 4/8 Krautrock + Ambient Music: Kraftwerk, Brian Eno, & Aphex Twin

- Listen: Kraftwerk, Eno, and Aphex Twin - due Tues. 4/8 at 11:59 pm
  - *Autobahn* (1974), Kraftwerk (1969-present)
  - "Discreet Music" (1975), Brian Eno (1948-)
  - "Ambient 1: Music for Airports" (1978), Brian Eno (1948-)
  - *Selected Ambient Works 85-92* (1992), Aphex Twin (1985-present)
- Write: Assignment 17: Uses of MIDI - due Thurs. 4/10 at 1:35 pm
- Final Project - Step 1: Claim a topic - due Fri. 4/11 at 11:59 pm

Thurs. 4/10 Techno: Juan Atkins, Derrick May, & Kevin Saunderson

- Listen: Cybotron, Rhythm is Rhythm, Kreem, and Autechre - due Thurs. 4/10 at 11:59 pm
    - *Clear* (1982), Cybotron (1980-1995)
    - "Nude Photo" (1987), Rhythm is Rhythm
    - *Triangle of Love* (1986), Kreem
    - *The Egg* (1992), Autechre (1987-present)
  - Final Project - Step 1: Claim a topic - due Fri. 4/11 at 11:59 pm
  - Final Project - Step 2: Submit your presentation - due Mon. 4/21 at 11:59 pm
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## Week 13 (4/15, 4/17)

Tues. 4/15 Hip Hop: DJ Kool Herc, Afrika Bambaataa, Grandmaster Flash, The Sugarhill Gang, & J Dilla

- Listen: Afrika Bambaataa and Grandmaster Flash - due Tues. 4/15 at 11:59 pm
  - "Planet Rock" (1982), Afrika Bambaataa (1957-)
  - *The Message* (1982), Grandmaster Flash (1958-)

Thurs. 4/17 Electronic Music Today

- Final Project - Step 3A: Sign up for a presentation spot - due Mon. 4/21 at 11:59 pm
  - Final Project - Step 3B: Be prepared to present to the class - due Tues. 4/22 at 1:35 pm
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## Week 14 (4/22, 4/24)

Tues. 4/22 Electronic Music Today: Student Presentations

- Peer Comments - presentation day 1 - due Tues. 4/22 at 3:00 pm

Thurs. 4/24 Electronic Music Today: Student Presentations

- Peer Comments - presentation day 2 - due Thurs. 4/24 at 3:00 pm
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## Week 15 (4/29, 5/1)

Tues. 4/29 Electronic Music Today: Student Presentations

- Peer Comments - presentation day 3 - due Tues. 4/29 at 3:00 pm

Thurs. 5/1 Electronic Music Today: Student Presentations

- Peer Comments - presentation day 4 - due Thurs. 5/1 at 3:00 pm
  - Read: Chapter Six: The History of Electronic and Computer Music - due Tues. 5/6 at 1:35 pm
    - 1. Electronic Music Historical Timeline - [https://cmtext.indiana.edu/history/chapter6\\_timeline.php](https://cmtext.indiana.edu/history/chapter6_timeline.php)
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**Finals Week (5/5 - 5/9)**

- Final Exam - TBA