MUC4441/6445 Electroacoustic Music Composition/Digital I Syllabus • Fall 2025

Dr. Felipe Tovar-Henao University of Florida, School of Music

Credits: 3

Course Description

Introduction to direct-digital software synthesis systems through flowcharting, programming, and instrument design, with emphasis on **sound synthesis concepts** and practical realization in **MaxMSP**. The course introduces additive, subtractive, modulation, and granular synthesis, as well as digital signal processing techniques such as filtering, reverberation, and spatialization. Attention is given to both technical and aesthetic issues in electroacoustic music composition.

Prerequisites

Consent of instructor or prior coursework in music technology.

Required Texts

- Roads, Curtis. *The Computer Music Tutorial.* (MIT Press, 1996).

Recommended Text

- Cipriani, Alessandro, and Maurizio Giri. *Electronic Music and Sound Design: Theory and Practice with Max 8*. (Contemponet, 2019–).

Materials Required

- (1) 32 GB Flash Drive (for data backup)
- Personal computer with MaxMSP (student license available from Cycling '74)

Grading

- 20% Tutorials/Reading
- 20% Research Paper
- 15% Listening Reports
- 15% Mid-Term (Written and Practical)
- 30% Final Project

Instructor Information

- Office: TBA
- Office Hours: TBA
- Email: felipe.tovar@ufl.edu

Policies

1. All listening selections are available via YouTube or library resources. Listen attentively and with advance planning.
2. Late work is not accepted.
3. Attendance is required. More than three absences will lower the grade incrementally.
4. All course work should be completed with personal resources; freeware or student licenses are available.
5. Plan ahead for composition projects; last-minute work is rarely successful.
6. Course requirements and schedule may be adjusted to meet class needs.
7. All students must abide by the UF Student Honor Code.
8. Students must comply with UF Software Copyright Policy.
9. UF Counseling and Wellness resources are available to all students.
10. Students requiring accommodations must first register with the Dean of Students Office and present documentation to the instructor.
11. Course evaluations will be completed online through GatorEvals.
12. Communication with the instructor is welcome at any time.

Infectious Illness Policy: If you are sick, do not attend class; follow UF health guidelines for medical evaluation.

Grading Scale

Letter Grade	Percentage Range
A	100–94%
A–	93–90%
B+	89–87%
B	86–83%

Letter Grade	Percentage Range
B–	82–80%
C+	79–77%
C	76–73%
C–	72–70%
D+	69–67%
D	66–63%
D–	62–60%
E	59–0%

Course Outline

Week 1 Getting Started: Introduction to MaxMSP environment, patching, signal flow, objects, basic sound design. Readings: Dodge chs. 1–3 (Computer Music Fundamentals, Psychoacoustics, Digital Audio).

Week 2 Additive Synthesis: Harmonic and inharmonic partials; building additive structures in Max using oscillators and summation. Readings: Dodge ch. 4.

Week 3 Digital Audio Basics: Amplitude, clipping, data rates, aliasing, envelopes. Patching study: amplitude shaping with Max envelopes.

Week 4 Subtractive Synthesis: Filtering noise and periodic sources; spectral shaping. Readings: Dodge ch. 6. *Listening Report 1 due.*

Week 5 Filters: Filter types and implementations; resonant filtering, delay-based resonators in Max.

Week 6 Speech Synthesis: Basic vocal tract models; formant filtering in Max.

Week 7 Distortion Synthesis: Frequency Modulation (FM). Readings: Dodge ch. 5.1. *Mid-term exam (take home).*

Week 8 FM Applications: Complex spectra, morphing between timbres.

Week 9 Waveshaping & Nonlinear Distortion. Readings: Dodge ch. 5.2. *Declare Final Project outline. Listening Report 2 due.*

Week 10 Delay and Reverberation: Designing spatial depth in Max. Readings: Dodge ch. 10.1.

Week 11 Localization and Real-Time Use: Binaural/spatialization techniques. Readings: Dodge ch. 10.2.

Week 12 Granular Synthesis: Grain clouds, density, pitch, time-stretching. Readings: Dodge ch. 8.

Week 13 Thanksgiving Break (no class).

Week 14 Advanced Topics: Convolution, compositional strategies with computers. *Research Paper Due.*

Week 15 Paper Presentations. *Listening Report 3 due.*

Week 16 Final Project Presentations and Review.

Course Components

- **Tutorials/Reading:** Each class includes practical patching studies in MaxMSP, linked to synthesis techniques. Students will demonstrate patches and results in class.
- **Listening Reports:** Written critiques of assigned works, focusing on the techniques and aesthetics employed.
- **Research Paper:** 10–15 pages on a synthesis or signal processing technique or related compositional approach.
- **Mid-Term Exam:** Written and practical exam covering core synthesis and signal processing concepts.
- **Final Project:** Original composition demonstrating synthesis techniques studied during the semester.

Safety and Professional Practices

- Always back up your work.
- Practice safe listening to prevent hearing damage.
- Respect studio/lab rules when using equipment.

Listening List (available online or via UF Library resources)

Assignment 1 (Weeks 1–4: Additive & Subtractive Synthesis, Filters)

- Jean-Claude Risset – *Mutations* (1969)
- Trevor Wishart – *Red Bird: A Political Prisoner's Dream* (1977)
- Kaija Saariaho – *Verblendungen* (1984)
- Jonathan Harvey – *Mortuos Plango, Vivos Voco* (1980)

- Curtis Roads – *Point Line Cloud* (2005, selections)
- James Tenney – *For Ann (rising)* (1969)

Assignment 2 (Weeks 5–9: FM, Distortion, Delay, Reverberation)

- John Chowning – *Stria* (1977)
- Horacio Vaggione – *Ash* (1990)
- Agostino Di Scipio – *Audible Ecosystemics No. 3a* (2002)
- Natasha Barrett – *Utility of Space* (2005)
- Paul Lansky – *Mild und Leise* (1973)
- Robert Normandeau – *Rumeurs* (1987)

Assignment 3 (Weeks 10–16: Granulation, Convolution, Spatialization, Real-time Performance)

- Denis Smalley – *Wind Chimes* (1987)
- Hildegard Westerkamp – *Kits Beach Soundwalk* (1989)
- François Bayle – *L'Expérience Acoustique* (1971, selections)
- Barry Truax – *Riverrun* (1986)
- Javier Álvarez – *Temazcal* (1984)
- Carla Scaletti – *SunSurgeAutomata* (1989)