Electroacoustic Composition Digital 2:
*Advanced Computer Music and Multichannel Systems*

Instructor: Dr. Andrew Babcock
Office: MUB 221
Office phone: (352) 273-3176
Office hours: TBD, or happily by appointment
Email: ababcock@arts.ufl.edu

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**Course Description:**

An advanced course in audio programming and multichannel, digital music composition using the graphical programming environment Max through guided exercises, assignments, and composition projects.

**Course Objectives:**

Students will learn advanced topics in computer music and digital instrument design using the Max programming language and their application in various multichannel speaker paradigms. Students develop software tools for real-time digital signal processing, machine listening, spatialization, sound design, synthesis, live electronics, interactive performance, and computer-assisted composition. Students receive bi-weekly assignments designed to facilitate learning and creative use of the Max environment. Students complete a final composition project designed to integrate different aspects of the course’s topic areas using Max.

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**Course Materials:**

Personal computer running Max 8 software on either macOS or Windows operating systems: [https://cycling74.com/](https://cycling74.com/)

Access to a digital audio workstation such as Reaper, Logic Audio, Ableton Live, Pro Tools, Cubase, Digital Performer, etc. (Reaper highly recommended for multichannel work)

SpatGris/ServerGris software: [http://gris.musique.umontreal.ca/](http://gris.musique.umontreal.ca/)
Ambisonics software packages:

http://www.ambisonictoolkit.net/


https://www.zhdk.ch/forschung/icst/software-downloads-5379/downloads-ambisonics-externals-for-maxmsp-5381

IRCAM Spat (on 3rd floor studio computer)

Audio routing:

http://jackaudio.org/

https://qjackctl.sourceforge.io/

Optional Texts:


Prerequisite:

Students are expected to have a strong command of the concepts and practice of digital sound synthesis and instrument design either through MUC 4313/5315 and MUC 4441/6444 or through equivalent courses/personal study.
Grade Distribution:

Attendance/Participation/Preparation: 20%
6 Small Projects/Assignments: 35%
Final Composition Project: 45%

Grades on projects and assignments are based on the following scale:

- A = 93–100%
- B = 83–86%
- C = 73–76%
- D = 63–66%
- A- = 90–92%
- B- = 80–82%
- C- = 70–72%
- D- = 60–62%
- B+ = 87–89%
- C+ = 77–79%
- D+ = 67–69%
- E = below 60%

Information on current UF grading policies for assigning grade points:
https://catalog.ufl.edu/UGRD/academic-regulations/grades-grading-policies/

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Course Schedule (tentative and subject to change)

<table>
<thead>
<tr>
<th>Week</th>
<th>Topic</th>
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| 1) Jan. 7 and 9 | Introduction/Course Overview /Review Syllabus
  Signal domain sequencing and parameter modulation |
<p>| 2) Jan. 14 and 16 | Signal domain sequencing and parameter modulation (cont.) |
| 3) Jan 23, no class Jan 21 | Advanced time domain signal processing |
| 4) Jan. 28 and 30 | Polyphony and instrument design with MC objects |
| 5) Feb. 4 and 6 | Polyphony and instrument design with MC objects (cont.) |
| 6) Feb. 11 and 13 | Stochastic distribution functions, data sonification |
| 7) Feb. 18 and 20 | Spectral domain signal processing – feature tracking, resynthesis, cross-synthesis, convolution, gating, delay, phase vocoding |
| 8) Feb. 25 and 27 | Interpolation and client object data storage with Pattr, Particle and Physics systems, Boids flocking simulations |
| 9) Mar. 4 and 6 | Spring Break! |</p>
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<thead>
<tr>
<th>Week</th>
<th>Dates</th>
<th>Topic</th>
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<tbody>
<tr>
<td>10)</td>
<td>Mar. 11 and 13</td>
<td>Wavetable and Formant synthesis, parallel processing with nodes</td>
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<tr>
<td>11)</td>
<td>Mar. 18 and 20</td>
<td>Gen~ programming – physical modeling and feedback</td>
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<td>12)</td>
<td>Mar. 25 and 27</td>
<td>Open Sound Control, Multichannel systems – point source</td>
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<td>13)</td>
<td>Apr. 1 and 3</td>
<td>Multichannel systems – VBAP and SpatGris/ServerGris</td>
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<tr>
<td>14)</td>
<td>Apr. 8 and 10</td>
<td>Multichannel systems – VBAP and SpatGris/ServerGris</td>
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<td>15)</td>
<td>Apr. 15 and 17</td>
<td>Multichannel systems – Ambisonics</td>
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<td>16)</td>
<td>Apr. 22 and 24</td>
<td>Multichannel systems – Ambisonics</td>
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<tr>
<td>17)</td>
<td>May 1</td>
<td>*Final Projects Gathering – 10am - 12pm</td>
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**Course Guidelines:**

**Attendance Policy**

Attendance is required for participation in this course. Should you miss class, it is your responsibility to obtain notes from the day(s) you were absent not from the instructor, but rather from one of your peers. Please note that once you acquire unexcused absences exceeding 3 class meetings, your final grade will suffer one whole letter grade.

**Late Work**

Late work is reduced one full letter grade for every day it is past due (ex. A to B). However, if you have extenuating circumstances please let me know as far in advance from the due date as you can.

**Email**

Please check your UF email account regularly, as I will be sending out information about assignments, important dates, and various handouts from time to time.
Cell Phones

Cell phone use is not permitted during class time. Please keep your phone off the computer desk and tucked away in your bag or pocket. Students caught using their phones during class will be marked absent for the day.

Concerts

Students are required to attend the Unbalanced Connection electroacoustic concert series (date and time TBD). Schedules permitting, students are also expected to help setup and take down audio/visual equipment before and after the concert. Unbalanced Connection give students firsthand experience with loudspeaker configuration, amplification, signal flow, software routing, microphone selection and placement, mixing console applications, and cabling.

Academic Honor Policy:

UF students are bound by The Honor Pledge which states, “We, the members of the University of Florida community, pledge to hold ourselves and our peers to the highest standards of honor and integrity by abiding by the Honor Code. On all work submitted for credit by students at the University of Florida, the following pledge is either required or implied: “On my honor, I have neither given nor received unauthorized aid in doing this assignment.” The Honor Code (https://sccr.dso.ufl.edu/students/student-conduct-code/) specifies a number of behaviors that are in violation of this code and the possible sanctions. Furthermore, you are obligated to report any condition that facilitates academic misconduct to appropriate personnel. If you have any questions or concerns, please consult with the instructor or TA in this class.

Online Course Evaluations:
Students are expected to provide feedback on the quality of instruction in this course by completing online evaluations at https://evaluations.ufl.edu. Evaluations are typically open during the last two or three weeks of the semester, but students will be given specific times when they are open. Summary results of these assessments are available to students at https://evaluations.ufl.edu/results/

Accommodations for Students with Disabilities:

Students with disabilities requesting accommodations should first register with the Disability Resource Center ( (352)-392-8565, www.dso.ufl.edu/drc/ ) by providing appropriate documentation. Once registered, students will receive an accommodation letter which must be presented to the instructor when requesting accommodation. Students with disabilities should follow this procedure as early as possible in the semester.
Health and Wellness Resources:

U Matter, We Care:
If you or a friend is in distress, please contact umatter@ufl.edu or (352) 392-1575 so that a team member can reach out to the student.

Counseling and Wellness Center: https://counseling.ufl.edu/about/ (352)-392-1575; and the University Police Department: 392-1111 or 9-1-1 for emergencies.

Sexual Assault Recovery Services (SARS): Student Health Care Center, 392-1161.

University Police Department, (352)-392-1111 (or 9-1-1 for emergencies): http://www.police.ufl.edu/

Academic Resources:

E-learning technical support, (352)-392-4357 (select option 2) or e-mail to Learning-support@ufl.edu https://lss.at.ufl.edu/help.shtml

Career Resource Center, Reitz Union, (352)-392-1601. Career assistance and counseling: http://www.crc.ufl.edu/

Library Support, Various ways to receive assistance with respect to using the libraries or finding resources: https://cms.uflib.ufl.edu/ask

Teaching Center, Broward Hall, (352)-392-2010 or (352)-392-6420. General study skills and tutoring: http://teachingcenter.ufl.edu/

Writing Studio, 302 Tigert Hall, (352)-846-1138. Help brainstorming, formatting, and writing papers: https://writing.ufl.edu/writing-studio/

Student Complaints Campus: https://www.dso.ufl.edu/documents/UF_Complaints_policy.pdf

On-Line Students Complaints: http://distance.ufl.edu/student-complaint-process/