

## Music 3734a – Digital Audio Recording

Dr R. Toft, TC 114, ext. 85104  
Term 1, Thursday 9:30-12:30, MB 242

This course provides an introduction to Pro Tools, as well as the fundamental principles of digitally recording and editing acoustic music in ambient spaces, that covers every step of the process. We will focus on stereo microphone techniques to help musicians understand the processes involved in crafting acoustic classical records. Many musicians spend thousands of hours preparing for the stage but relatively little time (if any) learning how to turn those performances into recorded sound. A public performance, replicated in front of microphones, rarely produces a satisfactory outcome on a distribution medium such as the compact disc or streaming service, for the methods engineers and producers use to shape what listeners hear through loudspeakers have an enormous impact on the way people react to recordings. By providing information on the art of committing performances to disc, the course will enable musicians to turn sound into raw tracking data that can be digitally edited into cohesive listening experiences.

The course deals with both theory and practice and focuses on classical music exclusively – the nature of soundwaves and their behaviour in rooms, microphone types and the techniques of recording in stereo, tracking through Pro Tools, “in-the-box” editing and mixing with software plugins, and the preparation of finished tracks for delivery in compressed and uncompressed files.

After considering the theory behind sound recording and analyzing representative commercial recordings, the remainder of the term will be spent gaining hands-on experience in editing, mixing, delivery, and the critical listening skills required for these activities.

The course will concentrate on editing, mixing, and delivery. We have ample recorded material to use.

### DAW

Our digital audio workstation will be Pro Tools. As the industry standard DAW, Pro Tools is an ideal platform for recording and editing acoustic music. Class members need to purchase or subscribe to Pro Tools. Educational pricing is available on the Avid website:

[https://shop.avid.com/ccrz\\_ProductDetails?viewState=DetailView&sku=DYNA20002&isCSRFlow=true&portalUser=&store=shop&utm\\_source=google&utm\\_medium=cpc&utm\\_campaign=PRO-EDU&utm\\_term=%2Bpro%20%2Btools%20%2Beducation&Adid=403978064360&matchtype=b&advertising=google&gclid=Cj0KCQjw-O35BRDVARIsAJU5mQVgkXSwtTgrdDpwyKBvMCGOi80knsJwg-WeKBJGGokIZ\\_dXfo043PMaAiCoEALw\\_wcB&cccl=en\\_CA](https://shop.avid.com/ccrz_ProductDetails?viewState=DetailView&sku=DYNA20002&isCSRFlow=true&portalUser=&store=shop&utm_source=google&utm_medium=cpc&utm_campaign=PRO-EDU&utm_term=%2Bpro%20%2Btools%20%2Beducation&Adid=403978064360&matchtype=b&advertising=google&gclid=Cj0KCQjw-O35BRDVARIsAJU5mQVgkXSwtTgrdDpwyKBvMCGOi80knsJwg-WeKBJGGokIZ_dXfo043PMaAiCoEALw_wcB&cccl=en_CA)

### TEXT

Robert Toft, *Digital Audio Recording*, 2017 – all the information in the book is directly applicable to the course, and you will need the book to prepare for tests. Available at the UWO bookstore.

### REQUIREMENTS

- to ensure that everyone keeps up with theoretical principles, there will be 2 mid-term tests
- completed recording (exported 16/44.1 wav and mp3 files, plus a detailed written description of the procedures followed)

### GRADING

2 tests – 66 2/3% – each one is worth 33 1/3% of the final mark – 2nd week of October, 2nd week of November

Final project (completed recording and written description) – worth 33 1/3% of the final mark (due last day of classes)

*Also see the section on class attendance below*

## CLASS ATTENDANCE

Not everything covered in the lectures is included in the text for the course, and students will acquire much of the framework necessary for the course through material presented in class. Regular attendance is essential as part of the preparation for tests and the final project. ***Attendance will be taken from 17 September 2021, and 5% of the final mark will be deducted for every part or full class missed (each 3-hour time slot consists of 3 separate classes), unless appropriate medical documentation has been submitted to the Dean's Office.***

## CONSULTATION

I am available for consultation outside class by appointment. Please contact me to arrange a time for a Zoom session. I prefer not to conduct course business by email, and I do not answer questions about course content by email. On the rare occasion that a student misses a lecture for legitimate and medically documented reasons, I will provide assistance with course material, but please be advised that I do not give private summaries of lectures. Students should rely on their peers to gather, and understand, material from classes they miss. See me only to clarify what you and your peers cannot grasp independently.

## MASKING GUIDELINES

***Students will be expected to wear triple layer, non-medical, paper masks at all times in the classroom*** as per University policy and public health directives. Students who are unable to wear a mask must seek formal accommodation through Western Accessible Education, and present medical documentation.

***Students are not permitted to eat or drink while in class to ensure masks stay in place.*** Students will be able to eat and drink outside of the classroom during scheduled breaks.

Students unwilling to wear a mask (or not wearing the mask so as to cover the nose and mouth) as stipulated by Western policy and public health directives will be referred to the Dean, and such actions will be considered a violation of the student Code of Conduct.

***Students in violation of the mask mandate will be asked to leave the classroom.***

## OTHER PROTOCOLS

Cell/mobile phones are prohibited in the classroom at all times, as they are high-touch surfaces.

## PREREQUISITE

None.

## GRADING SCALE

A+ = 90-100%, A = 80-89%, B = 70-79%, C = 60-69%, D = 50-59%, F = 0-49%.

## ACADEMIC CONSIDERATION FOR STUDENT ABSENCE

Students will have up to two (2) opportunities during the regular academic year to use an on-line portal to self-report an absence during the term, provided the following conditions are met: the absence is no more than 48 hours in duration, and the assessment for which consideration is being sought is worth 30% or less of the student's final grade. **Students are expected to contact their instructors within 24 hours of the end of the period of the self-reported absence, unless noted on the syllabus.** Students are not able to use the self-reporting option in the following circumstances:

- for exams scheduled by the Office of the Registrar (e.g., December and April exams)
- absence of a duration greater than 48 hours,
- assessments worth more than 30% of the student's final grade,
- if a student has already used the self-reporting portal twice during the academic year

If the conditions for a Self-Reported Absence are not met, students will need to provide a Student Medical Certificate if the absence is medical, or provide appropriate documentation if there are compassionate grounds for the absence in question. **Students are encouraged to contact their Faculty academic counselling office to obtain more information about the relevant documentation.**

Students should also note that individual instructors are not permitted to receive documentation directly from a student, whether in support of an application for consideration on medical grounds, or for other reasons. All documentation required for absences that are not covered by the Self-Reported Absence Policy must be submitted to the Academic Counselling office. For the Western University policy on Consideration for Student Absence, see:

[https://www.uwo.ca/univsec/pdf/academic\\_policies/appeals/Academic\\_Consideration\\_for\\_absences.pdf](https://www.uwo.ca/univsec/pdf/academic_policies/appeals/Academic_Consideration_for_absences.pdf)

and for the Student Medical Certificate (SMC), see:

[http://www.uwo.ca/univsec/pdf/academic\\_policies/appeals/medicalform.pdf](http://www.uwo.ca/univsec/pdf/academic_policies/appeals/medicalform.pdf)

### **COURSE ABSENCES DUE TO DAILY COVID SCREENING QUESTIONNAIRE**

Missed assessments (e.g., presentations, essays, quizzes, tests, midterms, etc.) require formal academic considerations (typically self-reported absences and/or academic counselling). Methods for dealing with missed work and course content are at the discretion of the instructor(s). Students should be aware that some learning outcomes cannot be easily made up and may need to be completed in a subsequent year. Your instructor will provide you with further information as to how this applies within this course.

Students who demonstrate a pattern of routinely missing coursework due to self-reported COVID symptoms, and therefore do not demonstrate mastery of the learning outcomes of the course, will not receive credit for the course.

### **ACADEMIC CONSIDERATION FOR MISSING WORK**

In cases where students are unable to submit work due to medical illness or compassionate grounds, if an online self-reported absence is submitted, or if appropriate supporting documentation is submitted to the Associate Dean's office, and the accommodation is granted, then the missed assessments may be rescheduled or discounted in the calculation of the final grade for the course, at the discretion of the instructor. If neither a self-reported absence nor an appropriate supporting document is submitted to the appropriate office, then the missed assignments will receive a grade of zero.

### **ACADEMIC OFFENCES**

Submission of work with which you have received help from someone else (other than the course instructor or TA) is an example of plagiarism, which is considered a major academic offence. Scholastic offences are taken seriously and students are directed to read the appropriate policy, specifically, the definition of what constitutes a Scholastic Offence, as found at:

[http://www.uwo.ca/univsec/pdf/academic\\_policies/appeals/scholastic\\_discipline\\_undergrad.pdf](http://www.uwo.ca/univsec/pdf/academic_policies/appeals/scholastic_discipline_undergrad.pdf)

### **MENTAL HEALTH & WELLNESS**

Students that are in emotional/mental distress should refer to the Health and Wellness at Western page (<https://www.uwo.ca/health/>) for a complete list of options about how to obtain help or to go to the Wellness Education Centre located in UCC room 76. **Students in crisis in need of immediate care are directed to go directly to Student Health Services in UC11 or to click on the green "I Need Help Now" button on the Health and Wellness page above.**

### **ACCOMMODATION FOR STUDENTS WITH DISABILITIES**

Students work with Accessible Education Western (AEW, formerly SSD) which provides recommendations for accommodation based on medical documentation or psychological and cognitive testing. The accommodation policy can be found here:

[https://www.uwo.ca/univsec/pdf/academic\\_policies/appeals/Academic%20Accommodation\\_disabilities.pdf](https://www.uwo.ca/univsec/pdf/academic_policies/appeals/Academic%20Accommodation_disabilities.pdf)

### **RELIGIOUS ACCOMMODATION**

Students should consult the University's list of recognized religious holidays, and should give reasonable notice in writing, prior to the holiday, to the Instructor and an Academic Counsellor if their

course requirements will be affected by a religious observance. Additional information is given in the Western Multicultural Calendar. <http://multiculturalcalendar.com/ecal/index.php?s=c-univwo>

### **PLAGIARISM**

Students must write their essays and assignments in their own words. Whenever students take an idea, or a passage from another author, they must acknowledge their debt both by using quotation marks where appropriate and by proper referencing, such as, footnotes or citations. Plagiarism is a major academic offence (see Scholastic Offence Policy in the Western Academic Calendar).

### **CONTINGENCY PLAN FOR AN IN-PERSON CLASS PIVOTING TO 100% ONLINE LEARNING**

In the event of a COVID-19 resurgence during the course that necessitates the course delivery moving away from face-to-face interaction, all remaining course content will be delivered entirely online, either synchronously (i.e., at the times indicated in the timetable) or asynchronously (e.g., posted on OWL for students to view at their convenience). The grading scheme will not change. Any remaining assessments will also be conducted online as determined by the course instructor. In the event that online learning is required, a stable internet connection with working microphone and webcam will be required. As has been the case in the past, the decision to pivot to online learning will be made by Western, and not individual instructors or departments (excepting temporary online instruction in the event of instructor illness).

### **EXAMINATIONS & ATTENDANCE**

Any student who, in the opinion of the instructor, is absent too frequently from class or laboratory periods in any course will be reported to the Dean of the Faculty offering the course (after due warning has been given). On the recommendation of the department concerned, and with the permission of the Dean of that Faculty, the student will be debarred from taking the regular examination in the course. The Dean of the Faculty offering the course will communicate that decision to the Dean of the Faculty of registration.

### **ELECTRONIC DEVICES IN EXAMS**

Electronic devices of any type will not be permitted during Midterm Tests and/or Final Exam in this course (unless required for accessibility reasons based on an approved accommodation request from Accessible Education).

### **ELECTRONIC DEVICES IN CLASSROOMS**

The in-class use of electronic devices (other than for instructor-approved in-class uses) is expressly prohibited. Students found guilty of disrupting the class with electronic devices will be asked to leave the class and may be subject to disciplinary measures under the Code of Student Conduct.

### **COMPUTER-MARKED MULTIPLE-CHOICE TESTS OR EXAMS**

These may be subject to submission for similarity review by software that will check for unusual coincidences in answer patterns that may indicate cheating.

## LEARNING OUTCOMES

Participants will gain an understanding of:

### ***The Nature of Sound and Its Electrical/Digital Representation***

- complex soundwaves
- the reflection of soundwaves in enclosed spaces and the nature of reverberation
- the differences between analog and digital audio
- bits, bit depth, pulse code modulation, sampling, quantization, encoding, dither, resolution
- AD and DA converters

### ***Production***

- common microphone types: condenser (pressure and pressure-gradient), dynamic, ribbon
- frequency response of microphones, directional patterns of capsules, distance factor
- proximity effect and issues relating to phase
- stereo playback and stereo microphone techniques
- coincident pairs (X-Y, Blumlein, M/S), near-coincident arrays (ORTF, NOS, DIN, OSS), spaced microphones (A-B, Faulkner, Decca tree)
- tracking – principles of critical listening, setting levels, room ambience

### ***Post-Production***

- digital filters (high pass, low pass, band pass, parametric) and EQ
- control of dynamic range – compressors, limiters, dynamic EQ, de-essers
- artificial reverberation – digital reflection simulation, convolution
- commercial plugins

### ***Delivery***

- file types – containers & codecs, uncompressed (wav, aiff), lossless compression (flac, alac), lossy compression (mp3, aac)
- file size
- loudness and meters (measurement standards, terminology of metering, true-peak meters, target levels, loudness practices)
- commercial plugins

### ***Common Recording Strategies***

- stereo miking of solo instruments, small ensembles, singer-songwriters
- advantages and disadvantages of various techniques

### ***Digital Editing and the Preparation of a Master Copy***

- digital audio workstation – features of Pro Tools and its keyboard shortcuts
- compilation of the final version from various takes
- mixing, metering, and the production of a master copy (use of EQ, dynamic range control, reverberation)
- preparation of the master for delivery on CD and for streaming services