

MUSIC & ENTERTAINMENT INDUSTRY STUDIES

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Overview

Music & Entertainment Industry Studies offers the following graduate programs:

- Media Forensics, MS (<http://catalog.ucdenver.edu/cu-denver/graduate/schools-colleges-departments/college-arts-media/music-entertainment-industry-studies/media-forensics-emphasis-ms/>)
- Recording Arts, MSRA (<http://catalog.ucdenver.edu/cu-denver/graduate/schools-colleges-departments/college-arts-media/music-entertainment-industry-studies/recording-arts-msra/>)

Programs

Music & Entertainment Industry Studies offers the following graduate programs:

- Media Forensics, MS (<http://catalog.ucdenver.edu/cu-denver/graduate/schools-colleges-departments/college-arts-media/music-entertainment-industry-studies/media-forensics-emphasis-ms/>)
- Recording Arts, MSRA (<http://catalog.ucdenver.edu/cu-denver/graduate/schools-colleges-departments/college-arts-media/music-entertainment-industry-studies/recording-arts-msra/>)

Please see the Undergraduate Catalog (<http://catalog.ucdenver.edu/cu-denver/undergraduate/schools-colleges-departments/college-arts-media/music-entertainment-industry-studies/>) or contact CAM@ucdenver.edu for information about the Bachelor of Science (BS) in Music with emphases in performance, singer/songwriter, music business and recording arts.

Faculty

Associate Professors:

David Bondelevitch, MFA, University of Southern California

Lorne Bregitzer, MS, University of Colorado Denver

Catalin Grigoras, PhD, University Politehnica Bucharest

Sam McGuire, MS, University of Colorado Denver

Assistant Professor:

Cecilia Wu, PhD, University of California Santa Barbara

Contact the Department of Music & Entertainment Industry Studies for information about additional graduate program faculty.

Media Forensics (MSMF) Courses

MSMF 5000 - Experiential Lab (1 Credit)

Students will understand laboratory procedures and the application of A/V technology in the field and in analysis through professional conferences and site visits to crime labs and government agencies. Students will respond to experiences regarding presentation, demonstration, and discussion components. Restriction: Restricted to MFOR-MS students. Repeatable. Max hours: 5 Credits. Grading Basis: Letter Grade Repeatable. Max Credits: 5. Restriction: Restricted to MFOR-MS students.

MSMF 5050 - Topics in Media Forensics (1-3 Credits)

Students learn theory and application through topical subjects designed to enhance theoretical and practical training in the analysis of forensic media. Emphasis will be placed on emerging technologies, methodological developments, and strengthening fundamental skills. These courses are repeatable for credit. Repeatable. Max hours: 5 Credits. Grading Basis: Letter Grade Repeatable. Max Credits: 5.

MSMF 5100 - Forensic Science and Litigation (3 Credits)

Critical analysis of legal precedent and court proceedings reveal to students the correlation between science and law in the litigation of forensic evidence. Assigned reading and research papers regarding evidence admissibility and scientific methodology will prepare students for evidence examination. Restriction: Restricted to MFOR-MS students. Max hours: 3 Credits. Grading Basis: Letter Grade Restriction: Restricted to MFOR-MS students. Typically Offered: Fall.

MSMF 5150 - Research Practices in Media Forensics (3 Credits)

An introduction to practical research techniques and forensic science periodicals provides students with a foundation for projects and reports in subsequent classes and for the research thesis. Library resources, research design, writing styles, and information technology will be discussed. Restriction: Restricted to MFOR-MS students. Max hours: 3 Credits. Grading Basis: Letter Grade Restriction: Restricted to MFOR-MS students. Typically Offered: Fall.

MSMF 5200 - Foundations in Media Forensics (3 Credits)

Students learn the foundational processes integral to forensic audio, video, and image analysis demonstrating knowledge through reading responses and documentation of procedures and methodology used in assigned projects. Topics include: media recording technology, analog/digital theory, multimedia compression, and equipment characterization. Prereq: MSMF 5100 and 5150 with a B- or higher. Restriction: Restricted to MFOR-MS students. Max hours: 3 Credits. Grading Basis: Letter Grade Prereq: MSMF 5100 and 5150 with a B- or higher. Restriction: Restricted to MFOR-MS students. Typically Offered: Spring.

MSMF 5250 - MATLAB Foundations (2 Credits)

An introduction to MATLAB workflow and its use in Media Forensics will be explored. Students will learn how to build program commands in scripts for signal analysis and to display graphical representations of data and statistics. Prereq: MSMF 5100 and 5150 with a B- or higher. Restriction: Restricted to MFOR-MS students. Max hours: 2 Credits.

Grading Basis: Letter Grade

Prereq: MSMF 5100 and 5150 with a B- or higher. Restriction: Restricted to MFOR-MS students.

Typically Offered: Spring.

MSMF 5300 - Computer Forensics (3 Credits)

Students explore computer forensics through guided projects and group discussion. An overview of computer hardware/software and characterization of storage media and file types will be covered through mock evidence examination documenting the search, seizure, and acquisition of forensic media. Prereq: MSMF 5200 and MSMF 5250 with a B- or higher. Restriction: Restricted to MFOR-MS students. Max hours: 3 Credits.

Grading Basis: Letter Grade

Prereq: MSMF 5200 and MSMF 5250 with a B- or higher. Restriction: Restricted to MFOR-MS students.

MSMF 5350 - Mobile Phone Forensics (1 Credit)

Students learn concepts regarding the proper handling of mobile phones to ensure evidence integrity and approaches to address the ever-changing field. Students are prepared for the acquisition and analysis of forensic media on personal devices through exercises and group projects. Prereq: MSMF 5200 and MSMF 5250 with a B- or higher. Restriction: Restricted to MFOR-MS students. Max hours: 1 Credit.

Grading Basis: Letter Grade

Prereq: MSMF 5200 and MSMF 5250 with a B- or higher. Restriction: Restricted to MFOR-MS students.

MSMF 5400 - Forensic Audio Analysis (3 Credits)

Students learn concepts through the application of techniques related to audio enhancement, digital media authentication, acoustic analysis, and automatic speaker recognition. The acquisition and analysis of digital evidence applying reliable methods prepares students for forensic audio analysis in the laboratory. Prereq: MSMF 5300 and 5350 with a B- or higher. Coreq: MSMF 5450. Restriction: Restricted to MFOR-MS students. Max hours: 3 Credits.

Grading Basis: Letter Grade

Prereq: MSMF 5300 and 5350 with a B- or higher. Coreq: MSMF 5450. Restriction: Restricted to MFOR-MS students.

Typically Offered: Fall.

MSMF 5450 - MATLAB for Forensic Audio Analysis (1 Credit)

Advanced application of MATLAB for the forensic analysis of audio will be presented including file access, FFT and waveform plotting, and signal detection. Through the exploration of correlation and using mean quadratic difference students will be prepared for media authentication. Prereq: MSMF 5300 and 5350 with a B- or higher. Coreq: MSMF 5400.

Restriction: Restricted to MFOR-MS students. Max hours: 1 Credit.

Grading Basis: Letter Grade

Prereq: MSMF 5300 and 5350 with a B- or higher. Coreq: MSMF 5400. Restriction: Restricted to MFOR-MS students.

Typically Offered: Fall.

MSMF 5500 - Forensic Video and Image Analysis (3 Credits)

Students learn concepts through the application of techniques related to forensic video collection and image enhancement, authentication, photogrammetry, and comparison. The acquisition and analysis of digital evidence applying reliable methods prepares students for working on forensic imagery in the laboratory. Prereq: MSMF 5400 and 5450 with a B- or higher. Coreq: MSMF 5550. Restriction: Restricted to MFOR-MS. Max hours: 3 Credits.

Grading Basis: Letter Grade

Prereq: MSMF 5400 and 5450 with a B- or higher. Coreq: MSMF 5550. Restriction: Restricted to MFOR-MS.

Typically Offered: Spring.

MSMF 5550 - MATLAB for Forensic Video and Image Analysis (1 Credit)

Advanced application of MATLAB for the forensic analysis of images will be presented covering image processing and analysis techniques. Through exploring analyses such as Photo Response Non-Uniformity and the BI-Dimensional DFT, students are prepared for image authenticity examinations. Prereq: MSMF 5400 and 5450 with a B- or higher. Coreq: MSMF 5500. Restriction: Restricted to MFOR-MS. Max hours: 1 Credit.

Grading Basis: Letter Grade

Prereq: MSMF 5400 and 5450 with a B- or higher. Coreq: MSMF 5500. Restriction: Restricted to MFOR-MS.

Typically Offered: Spring.

MSMF 5600 - Report Writing and Court Testimony (3 Credits)

Students are prepared for expert witness testimony through the analysis of mock evidence, complimentary report preparation, and subsequent mock trial. This capstone experience will demonstrate a student's technical writing and presentation skills and exercise the creation of demonstrative materials. Prereq: MSMF 5500 and 5550 with a B- or higher. Restriction: Restricted to MFOR-MS students. Max hours: 3 Credits.

Grading Basis: Letter Grade

Prereq: MSMF 5500 and 5550 with a B- or higher. Restriction: Restricted to MFOR-MS students.

MSMF 6900 - Research Thesis in Media Forensics (4 Credits)

Students work closely with their thesis advisor in selecting a topic for original research and scientific publication. This capstone project creates an area of specialty for degree candidates. Approved materials are evaluated through report submission and thesis defense. Prereq: MSMF 5600 with a B- or higher. Restriction: Restricted to MFOR-MS students. Max hours: 4 Credits.

Grading Basis: Letter Grade with IP

Prereq: MSMF 5600 with a B- or higher. Restriction: Restricted to MFOR-MS students.

Recording Arts (MRSA) Courses

MSRA 5000 - Introduction to Graduate Studies (3 Credits)

Surveys existing literature and research in science, technology, and pedagogy of recording arts. Extensive use of available resources in library, electronic and print, trade and scientific publications are explored. Use of computer applications for research and publication are developed. Max hours: 3 Credits.

Grading Basis: Letter Grade

Restriction: Restricted to RCDA-MS majors within the College of Arts and Media

MSRA 5001 - MSRA Research Seminar (3 Credits)

In preparation for their thesis/portfolio, students learn research techniques by: applying skills from MSRA 5000, learning research design, performing research, interpreting results, and writing. Students will discover opportunities to add to the body of audio literature and recording techniques. Max hours: 3 Credits.

Grading Basis: Letter Grade

Restriction: Restricted to RCDA-MS majors within the College of Arts and Media

MSRA 5125 - Sound & Music for Video Games I (3 Credits)

This course will give students an overview of the function of sound and music for video games including: history, sound engines, types of audio utilized, stereo and surround sound localization, music capabilities of hardware configurations and future trends in sound for video games.

Restriction: Restricted to RCDA-MS majors within the College of Arts and Media. Max hours: 3 Credits.

Grading Basis: Letter Grade

Restriction: Restricted to RCDA-MS majors within the College of Arts and Media

Typically Offered: Fall.

MSRA 5135 - Sound & Music for Video Games II (3 Credits)

Course is a continuation of Sound and Music for Video Games. Topics of study include non-linear music composition and implementation, advanced sound design techniques, optimization, and hands-on experience with modern game engines and game audio engines. Prereq: MSRA 5125. Restriction: Restricted to RCDA-MS majors within the College of Arts and Media. Max hours: 3 Credits.

Grading Basis: Letter Grade

Prereq: MSRA 5125. Restriction: Restricted to RCDA-MS majors within the College of Arts and Media.

Typically Offered: Fall.

MSRA 5360 - Music, Meditation and Technology (3 Credits)

Interdisciplinary course on acoustic ecology, sound art, and music technology. Through deep listening, compassionate listening, soundwalking, and interactive music controlled by motion capture, the unifying theme of this course is an engagement with sonic awareness, environment, and self-exploration. Restriction: Restricted to RCDA-MS majors within the College of Arts and Media. Cross-listed with MUSC 4360. Max hours: 3 Credits.

Grading Basis: Letter Grade

Restriction: Restricted to RCDA-MS majors within the College of Arts and Media

MSRA 5380 - Advanced Electronic Music Production & Performance (3 Credits)

This course is designed to take a deeper dive into music, electronic music, as well as perceptions of music. Students will be able to create generative compositions, single sample-based compositions, a performative electronic composition, and incorporate multimedia elements into their compositions. Restriction: Restricted to RCDA-MS majors within the College of Arts and Media. Cross-listed with MUSC 4380. Max hours: 3 Credits.

Grading Basis: Letter Grade

Restriction: Restricted to RCDA-MS majors within the College of Arts and Media

MSRA 5500 - Topics in Professional Audio (1 Credit)

Selected topical subjects to include live or studio sound recording, sound reinforcement, new technologies or practices in the audio industry.

Repeatable. Max Hours: 9 Credits.

Grading Basis: Letter Grade

Repeatable. Max Credits: 9.

Restriction: Restricted to RCDA-MS majors within the College of Arts and Media

MSRA 5505 - Introduction to Audio Post Production (3 Credits)

Reviews all aspects of audio synchronized with picture, including music, sound effects, narration, and dialog replacement. Topics studied with respect to film, video and multi-media. Cross-listed with MUSC 3505. Max Hours: 3 Credits.

Grading Basis: Letter Grade

Restriction: Restricted to RCDA-MS majors within the College of Arts and Media

MSRA 5510 - Topics in Recording Arts (3 Credits)

Selected topical subjects to include live or studio sound recording, sound reinforcement, new technologies or practices in the audio industry. Max hours: 9 Credits.

Grading Basis: Letter Grade

Repeatable. Max Credits: 9.

Typically Offered: Fall, Spring, Summer.

MSRA 5515 - History of 20th Century Film Music (3 Credits)

This survey of the history of 20th century music in film will acquaint aspiring filmmakers and musicians with a history of the music, as well as concepts of film theory and the creative use of film music. Restricted to RCDA-MS majors within the College of Arts and Media. Max hours: 3 Credits.

Grading Basis: Letter Grade

Restriction: Restricted to RCDA-MS majors within the College of Arts and Media

MSRA 5525 - Multimodal Interaction for Music (3 Credits)

This course explores human-computer interaction in music composition and performance. Students will learn to program and use open-source hardware to build novel and creative musical interfaces and instruments. Restriction: Restricted to Graduate Students. Max hours: 3 Credits.

Grading Basis: Letter Grade

Restriction: Graduate level students.

MSRA 5530 - Live Sound Reinforcement (3 Credits)

This course focuses on the basic elements of sound reinforcement: acoustics, equalization, equipment and mixing techniques. The major emphasis is the production of the final sonic product. Max hours: 3 Credits.

Grading Basis: Letter Grade

Restriction: Restricted to RCDA-MS majors within the College of Arts and Media

MSRA 5535 - Sound Effects & Foley for Visual Media (3 Credits)

Techniques for recording sound effects in the field and recording Foley in the studio. Use of library effects. Use of mixing techniques and plug-ins to create more complex sounds. Cross-listed with MUSC 4535. Prereq: MSRA 5505. Max Hours: 3 Credits.

Grading Basis: Letter Grade

Prereq: MSRA 5505.

MSRA 5545 - Music Editing in Visual Media (3 Credits)

Music editing for film and television. Spotting notes, temp tracks, cue sheets, scoring session management, dubbing stage fixes, and Performing Rights Artists notes. Cross-listed with MUSC 3545. Prereq: MSRA 5505. Max Hours: 3 Credits.
Grading Basis: Letter Grade
Prereq: MSRA 5505.

MSRA 5550 - Audio Production III (3 Credits)

Advanced studies in sound recording and reinforcement, aesthetics and techniques of multi-track analog and digital recording and stereo imaging. Team lab recording projects. Max hours: 3 Credits.
Grading Basis: Letter Grade
Restriction: Restricted to RCDA-MS majors within the College of Arts and Media

MSRA 5555 - Dialogue Editing & Mixing for Visual Media (3 Credits)

Dialogue editing and mixing for film and television. Recording Voiceover, Automated Dialogue Replacement, Group ADR, Efforts. Noise-reduction, mix levels, compression, limiting, EQ and use of reflected sound. Cross-listed with MUSC 3555. Prereq: MSRA 5505. Max hours: 3 Credits.
Grading Basis: Letter Grade
Prereq: MSRA 5505.

MSRA 5560 - Mastering & Advanced Digital Audio (3 Credits)

A study and practice of the art of mastering. Topics covered include: history, monitoring, signal flow, metering, jitter, audio restoration, limiting, creating a CD pre-master, & mastering for new media. Students will get practical experience mastering their own projects. Max hours: 3 Credits.
Grading Basis: Letter Grade
Restriction: Restricted to RCDA-MS majors within the College of Arts and Media

MSRA 5565 - Re-recording Mixing for Visual Media (3 Credits)

Techniques for mixing dialogue, ADR, music, sound effects, background ambiences and Foley. Different level standards and deliverables. Cross-listed with MUSC 4545. Prereq: MSRA 5535 or MSRA 5555. Max Hours: 3 Credits.
Grading Basis: Letter Grade
Prereq: MSRA 5535 or MSRA 5555.

MSRA 5575 - Graduate Surround Sound (3 Credits)

This lecture-lab course deals with surround sound in film, digital TV and DVD's. Topics include monitoring, microphone techniques, recording, mixing, mastering, delivery formats and psychoacoustics. Students work on two lab projects in the semester. Max hours: 3 Credits.
Grading Basis: Letter Grade
Restriction: Restricted to RCDA-MS majors within the College of Arts and Media

MSRA 5576 - Surround Sound II (4 Credits)

Students will work on advanced surround sound projects and study mixing aesthetics, high-definition technology and authoring. Students will have advanced knowledge of these topics and produce professional, competitive material for their demo. Prereq: MSRA 5550, 5575 and 5505, or permission of instructor. Max hours: 4 Credits.
Grading Basis: Letter Grade
Restriction: Restricted to RCDA-MS majors within the College of Arts and Media

MSRA 5580 - Graduate Audio Seminar I (3 Credits)

Faculty and majors of the music engineering program assemble to discuss and demonstrate issues of artistic and technical applications of recording technology. Student projects, faculty, and guest lectures provide topical focus. Repeatable. Max hours: 6 Credits.
Grading Basis: Letter Grade
Repeatable. Max Credits: 6.
Restriction: Restricted to RCDA-MS majors within the College of Arts and Media

MSRA 5581 - Graduate Audio Seminar II (3 Credits)

Capstone project based course in which students complete professional quality projects in music production and/or post production. Students refine their engineering skills and develop new skills required for integration in the music industry such as portfolio design and resume development. Max hours: 3 Credits.
Grading Basis: Letter Grade
Repeatable. Max Credits: 3.
Restriction: Restricted to RCDA-MS majors within the College of Arts and Media

MSRA 5590 - Graduate Audio Production (3 Credits)

Deals with advanced audio skills for music recording, including technical and artistic considerations. This is a required course for the MSRA degree. Max hours: 4 Credits.
Grading Basis: Letter Grade
Repeatable. Max Credits: 4.
Restriction: Restricted to RCDA-MS majors within the College of Arts and Media

MSRA 5600 - Topics in Music (1-3 Credits)

Various topics relating to the study of music performance, music technology and music business. Repeatable. Max Hours: 9 Credits.
Grading Basis: Letter Grade
Repeatable. Max Credits: 9.

MSRA 5605 - Audio Post Production II (3 Credits)

Students will learn advanced Pro Tools techniques by designing, conceptualizing, and completing sound for a student film project. This interdisciplinary course prepares students for working relationships between Recording Arts, Film and Video areas and an entry level job in post production. Max hours: 3 Credits.
Grading Basis: Letter Grade
Restriction: Restricted to RCDA-MS majors within the College of Arts and Media

MSRA 5820 - Digital Music Techniques (3 Credits)

Studies the general principles and applications of digital music technology, emphasizing the function and operation of specific computer software. Topics include digital audio workstations, MIDI sequencers, digital signal processing programs, and distribution on optical discs and computer-based mediums. Max hours: 3 Credits.
Grading Basis: Letter Grade
Restriction: Restricted to RCDA-MS majors within the College of Arts and Media

MSRA 5840 - Independent Study for MSRA (1-3 Credits)

Allows graduate students to pursue in-depth study of an audio-related topic, to be discussed with and approved by the Graduate Advisor. A final report or other tangible results will be determined on a case-by-case basis. Repeatable. Max Hours: 3 Credits.
Grading Basis: Letter Grade
Repeatable. Max Credits: 3.

MSRA 5939 - Master of Science in Recording Arts Internship (1-3 Credits)

Master of Science in Recording Arts Internship. Restrictions: Restricted to RCDA-MS majors within the College of Arts and Media. Repeatable.

Max hours: 6 Credits.

Grading Basis: Letter Grade

Repeatable. Max Credits: 6.

Restriction: Restricted to RCDA-MS majors within the College of Arts and Media

Typically Offered: Fall, Spring, Summer.

MSRA 6214 - Forensic Audio Analysis (3 Credits)

Students learn concepts through the application of techniques related to audio enhancement, digital media authentication, acoustic analysis, and automatic speaker recognition. The acquisition and analysis of digital evidence applying reliable methods prepares students for forensic audio analysis in the laboratory. Coreq: MSRA 6254 and admittance to Certification in Forensic Audio Analysis Program required. Max hours: 3 Credits.

Grading Basis: Letter Grade

Coreq: MSRA 6254

MSRA 6224 - Forensic Video and Image Analysis (3 Credits)

Students learn concepts through the application of techniques related to forensic video collection and image enhancement, authentication, photogrammetry, and comparison. The acquisition and analysis of digital evidence applying reliable methods prepares students for working on forensic imagery in the laboratory. Coreq: MSRA 6264 and admittance to Certification in Forensic Video and Image Analysis Program required. Max hours: 3 Credits.

Grading Basis: Letter Grade

Coreq: MSRA 6264

MSRA 6254 - MATLAB for Forensic Audio Analysis (1 Credit)

Advanced application of MATLAB for the forensic analysis of audio will be presented including file access, FFT and waveform plotting, and signal detection. Through the exploration of correlation and using mean quadratic difference students will be prepared for media authentication. Coreq: MSRA 6214 and admittance to Certification in Forensic Audio Analysis Program required. Max hours: 1 Credit.

Grading Basis: Letter Grade

Coreq: MSRA 6214

MSRA 6264 - MATLAB for Forensic Video and Image Analysis (1 Credit)

Advanced application of MATLAB for the forensic analysis of images will be presented covering image processing and analysis techniques. Through exploring analyses such as Photo Response Non-Uniformity and the Bi-Dimensional DFT, students are prepared for image authenticity examinations. Coreq: MSRA 6224 and admittance to Certification in Forensic Video and Image Analysis Program required. Max hours: 1 Credit.

Grading Basis: Letter Grade

Coreq: MSRA 6224

MSRA 6510 - Graduate Audio Studies Pedagogy (3 Credits)

Surveys available resources for audio education. Interdisciplinary materials in physics, acoustics, engineering, music, broadcast, medicine, psychology, multi-media, theater, and film or video are reviewed.

Emphasis on design and development of new methods and materials are pursued. (MSRA graduate students only.) Prereq: MUSC 5000. Max hours: 3 Credits.

Grading Basis: Letter Grade

Restriction: Restricted to RCDA-MS majors within the College of Arts and Media

MSRA 6550 - Sound Design (4 Credits)

Deals with designing sound for live theater, film, video, television, theme parks, games and soundscapes. Focuses on using technology to achieve specific esthetic aspects of audio production. This is accomplished through lectures, listening assignments, research and lab practice. (For graduate students only.) Max hours: 4 Credits.

Grading Basis: Letter Grade

MSRA 6950 - Thesis in Professional Audio (4 Credits)

With the guidance of a thesis advisor, each candidate for the MSRA degree select an approved topic for scholarly review, research and publication. The approved materials are evaluated for written and oral defense. Prereq: MUSC 5000, 5590, 6510, 6580, 6530. Max hours: 4 Credits.

Grading Basis: Letter Grade with IP

Restriction: Restricted to RCDA-MS majors within the College of Arts and Media

MSRA 6951 - Professional Audio Portfolio Thesis (4 Credits)

With the guidance of a portfolio advisor, each candidate for the MSRA degree produce specified documentation and audio materials that reflect the career intentions of the candidate. A completed "Show kit" or professional "Demo" of the candidate's specialty are produced. The approved materials are evaluated for written, audio and oral defense. Max hours: 4 Credits.

Grading Basis: Letter Grade with IP

Restriction: Restricted to RCDA-MS majors within the College of Arts and Media