MUSIC ENGINEERING (MUE)

Music Engineering Technology

Since 1975, the Music Engineering Technology program at the University of Miami Frost School of Music has pioneered education in music and technology, setting the standard by which the National Association of Schools of Music (NASM) accredits other such programs around the United States. Alumni of the program have contributed significantly to the music and audio industries and upon graduation pursue careers ranging from recording engineer to software designer.

The Music Engineering Technology program offers a two-year Master of Science graduate degree for students who have completed an undergraduate degree in electrical engineering or computer science. These students study the software and hardware design of audio systems and perform independent research that culminates in a thesis project. Upon graduation, these students are widely placed in top corporations that span the audio industry. For more information, please visit the website for the Music Engineering Technology program (https://musicengineering.frost.miami.edu/).

Masters Programs:

- M.S. in Music Engineering Technology (http://bulletin.miami.edu/graduate-academic-programs/music/music-engineering/music-engineering-technology-ms/)

MUE 601. Transducer Theory. 3 Credit Hours.
Course covers the fundamentals of electromagnetism and audio transducer theory including loudspeaker and microphone systems. Classical electro acoustical analysis of transducers including acoustic suspension, bass-reflex, transmission line, electrostatic and horn loudspeakers, dynamic, ribbon and condenser pressure, and pressure-gradient microphones. Students use computer-aided design programs and Thiele-Small parameterization to model loudspeakers and measure loudspeaker responses. Open to MUE and EAN Majors only.
Components: LEC.
Grading: GRD.
Typically Offered: Spring.

MUE 602. Audio Signal Processing I. 3 Credit Hours.
A study of the theory and practice of digital audio topics including discrete t ime sampling, quantization, dithering, PCM, A/D and D/A conversion, digital fil tering, oversampling, modulation codes, timebase, error correction codes, magne tic storage, DAT, and optical storage.
Requisite: Frost School of Music only.
Components: LEC.
Grading: GRD.
Typically Offered: Fall.

MUE 603. Audio Signal Processing II. 3 Credit Hours.
A study of the theory and practice of digital audio topics including fiber optics and networks, compact disc, interconnection, psychoacoustics, low bit-rate perceptual coding, MPEG, digital audio broadcasting, sigma-delta conversion, noise shaping, digital video, and emerging technologies. Open to MUE and EAN Majors only.
Components: LEC.
Grading: GRD.
Typically Offered: Spring.

MUE 604. Audio Signal Processing III. 3 Credit Hours.
Theory, design, and development of computer audio synthesizers and analyzers. Students implement software synthesizers including analog and physical modeling, wave-table, wave-shaping, and FM designs. Classical and modern theories of timbre and time-frequency analysis are included.
Components: LEC.
Grading: GRD.
Typically Offered: Offered by Announcement Only.

MUE 606. Current Trends in Music Engineering II. 3 Credit Hours.
MUE 606 addresses current technologies, skills, and techniques employed in a specific aspect of the audio technology and/or music technology fields.

Components: LEC.
Grading: GRD.
Typically Offered: Spring.

MUE 608. Current Trends in Music Engineering III. 3 Credit Hours.
MMI 608 addresses current technologies, skills, and techniques employed in a specific aspect of the audio technology and/or music technology fields.

Components: LEC.
Grading: GRD.
Typically Offered: Offered by Announcement Only.

MUE 610. Computational Psychoacoustics. 3 Credit Hours.
This course deals with the fundamentals of audition in human biological systems, including auditory sensory transduction, cochlear processes, neural pathways, cortical organization, and auditory illusions, with specific applications to perceptual data reduction techniques and auditory displays.
Requisite: Frost School of Music only.
Components: LEC.
Grading: GRD.
Typically Offered: Offered by Announcement Only.

MUE 611. Current Trends in Music Engineering IV. 3 Credit Hours.
MUE 611 addresses current technologies, skills, and techniques employed in a specific aspect of the audio technology and/or music technology fields.

Components: LEC.
Grading: GRD.
Typically Offered: Offered by Announcement Only.

MUE 620. Audio Technology for Musicians. 3 Credit Hours.
Introduction and overview of audio technology with emphasis on music recording, production equipment, and techniques. Topics include microphones, loudspeakers, mixing consoles, interconnection, amplifiers, digital processing, time code, and surround sound. Open to non-MUE majors.

Components: LEC.
Grading: GRD.
Typically Offered: Fall.

MUE 621. Timbral Ear Training. 3 Credit Hours.
Students in this course will accomplish four primary goals: 1) instantaneous discernment of ISO frequency regions and critical bands; 2) aural identification of audio-processing techniques, artifacts, and problems; 3) development of critical thinking skills and competence in current audio listening test methodologies; and 4) successful completion of a comprehensive bank of critical listening “golden ears” tests
Components: LEC.
Grading: GRD.
Typically Offered: Offered by Announcement Only.

MUE 694. Special Topics in Music Engineering Technology. 1-3 Credit Hours.
Advanced group/classroom instruction pertaining to faculty member’s expertise and students’ areas of interest.
Components: SEM.
Grading: GRD.
Typically Offered: Offered by Announcement Only.

MUE 705. Current Trends in Music Engineering I. 3 Credit Hours.
This seminar-style course introduces new graduate students to research, the thesis process, and graduate-level music engineering topics, ranging from conceptual to practical. Theory, design and development of audio signal processing techniques. Topics include DSP architectures, systems design, algorithm development, and applications.DSP development tools used to write, debug, and test programs including time-domain based effects such as reverb, chorus, flanging, and digital delay as well as frequency-domain projects such as FIR, IIR, and FFT filters and vocoders.
Components: LEC.
Grading: GRD.
Typically Offered: Fall.

MUE 706. Current Topics in Audio Analysis and Signal Processing. 3 Credit Hours.
MUE 706 surveys recent topics related to audio analysis, synthesis, and signal processing with an emphasis in software programming and practical applications. Course material is drawn from several topics: current audio APIs and plug-in architectures, computational theories of musical timbre, machine listening, spatial audio, digital audio effects, new digital audio synthesis techniques, and machine-musician interaction modalities.
Requisite: Frost School of Music only.
Components: LEC.
Grading: GRD.
Typically Offered: Offered by Announcement Only.

MUE 753. Transducer Workshop. 1 Credit Hour.
Fundamentals of electromagnetism and audio transducer theory including loudspeaker and microphone systems. Classical electro-acoustical analysis of transducers including acoustic suspensions, bass-reflex, transmission line, electrostatic and horn loudspeakers, dynamic, ribbon and condenser pressure, and pressure-gradient microphones. Students use computer-aided design programs and Thiele-Small parameterizaton to model loudspeakers and measure loudspeaker responses.
Requisite: Frost School of Music only.
Components: LEC.
Grading: GRD.
Typically Offered: Offered by Announcement Only.

MUE 793. Special Projects in Music Engineering Technology. 1-3 Credit Hours.
Advanced individual instruction pertaining to faculty member's area of expertise and student's area of interest. This course includes a culminating project.
Components: IND.
Grading: GRD.
Typically Offered: Offered by Announcement Only.

MUE 794. Special Topics in Music Engineering Technology. 1-3 Credit Hours.
Advanced group/classroom instruction pertaining to faculty member's expertise and students' areas of interest.
Components: SEM.
Grading: GRD.
Typically Offered: Offered by Announcement Only.

MUE 813. Master's Research Project. 1-3 Credit Hours.
The student working on his/her master's research project enrolls for credit as determined by his/her advisor. Credit is not awarded until the project paper is accepted.
Components: THI.
Grading: SUS.
Typically Offered: Fall & Spring.

MUE 820. Research in Residence. 1 Credit Hour.
Used to establish research in residence and maintain full-time enrollment for the master's degree after the student has completed the required hours of thesis or project credit.
Components: THI.
Grading: SUS.
Typically Offered: Fall, Spring, & Summer.