

# B.S. IN MUSIC ENGINEERING TECHNOLOGY

## Introduction

The mission of the Music Engineering Technology program is to:

1. Provide the highest quality education in the field of music engineering.
2. Promote advancements in the fidelity and creativity of music recording, production and reproduction.
3. Promote advancements in the invention, design and implementation of audio hardware and software.

The goals of the Music Engineering Technology program are to:

1. Further enhance the program's national and international stature.
2. Obtain teaching infrastructure and resources needed to provide contemporary education in the field of music engineering technology.
3. Ensure that curricular offerings are current and able to educate students in new and future theory and practice.
4. To help graduates find professional career positions.

## Educational Objectives

- Understanding the theoretical basis of sound recording, processing and reproduction.
- Understanding the practice techniques used in sound recording, processing and reproduction.
- Designing and implementing original audio hardware and/or software.
- Understanding the principles of computer science (Bachelor of Music) or electrical engineering (Bachelor of Science).

The Music Engineering Technology curriculum is designed for musicians interested in pursuing a career in music recording, audio hardware and software design, and related professions in the audio, audio-video, multimedia, and internet industries. The program is interdisciplinary in nature; it includes courses in music, music engineering, computer science, electrical engineering, and mathematics. This program includes a minor in Electrical Engineering or a double major in Computer Science. Freshman students are expected to enroll in calculus, which carries a prerequisite of Trigonometry and Analytical Geometry. Prospective students are expected to have a strong background in music performance and in mathematics.

## Curriculum Requirements with Computer Engineering Minor

Code	Title	Credit Hours
<b>General Education Requirements</b>		
Written Communication Skills:		
WRS 105	First-Year Writing I	3
WRS 106 or ENG 106	First-Year Writing II Writing About Literature and Culture	3
Quantitative Skills:		
MTH 161	Calculus I <sup>3</sup>	4
Areas of Knowledge:		
Arts & Humanities Cognate (9 credits) (fulfilled through the major)		
People & Society Cognate		9
STEM Cognate (9 credits) (fulfilled through the Computer Engineering minor)		
<b>Additional Requirements</b>		
UMX 100	The University of Miami Experience	0
Advanced Writing and Communication Skills (3 courses) See details below.		
<b>Experiential Music Curriculum Core Courses MUE <sup>1</sup></b>		
MUE 13	Music Engineering Forum (8 semesters)	8
MXX XX1 (Level 1)	Principal Instrument Lesson & Studio Class (semesters 1-4, 2 credit hours)	8
MXX XX3 (Level 3)	Principal Instrument Lesson & Studio Class (semesters 5-6, 2 credit hours)	4
MTC 140 or MSJ 140 or MDE 140	Experiential Musicianship I Experiential Musicianship I Experiential Musicianship I	3
MTC 141	Experiential Musicianship II	3

or MSJ 141	Experiential Musicianship II	
or MDE 141	Experiential Musicianship II	
MTC 240	Experiential Musicianship III	3
or MSJ 240	Experiential Musicianship III	
or MDE 240	Experiential Musicianship III	
MTC 241	Experiential Musicianship IV	3
or MSJ 241	Experiential Musicianship IV	
or MDE 241	Experiential Musicianship IV	
MTC 107	Skills Lab I (co-requisite MTC 140/MSJ 140/MDE 140)	1
or MSJ 107	Skills Lab I	
or MDE 107	Skills Lab I	
MTC 108	Skills Lab II (co-requisite MTC 141/MSJ 141/MDE 141)	1
or MSJ 108	Skills Lab II	
or MDE 108	Skills Lab II	
MTC 207	Skills Lab III (co-requisite MTC 240/MSJ 240/MDE 240)	1
or MSJ 207	Skills Lab III	
or MDE 207	Skills Lab III: American Song Traditions	
MTC 208	Skills Lab IV (co-requisite MTC 241/MSJ 241/MDE 241)	1
or MSJ 208	Skills Lab IV	
or MDE 208	Skills Lab IV: American Song Traditions	
MKP 140	Keyboard Studies I (MSJ 103 if enrolled in MSJ theory)	1
MKP 141	Keyboard Studies II (MSJ 104 if enrolled in MSJ theory)	1
MCY 140	Experiencing Music	3
MCY 141	European Musical Traditions (AWC)	3
MUE 251	Electronic Production Techniques	3
MIN 310	Music Business and Entrepreneurship for Musicians	3
	Ensembles (semesters 1-6, 1 credit hour)	6
<b>Courses in the MUE Major</b>		
MUE 160	Audio Recording Workshop	3
MUE 161	Audio Mixing Workshop	3
MUE 220	Introduction to Music Recording	3
MUE 401	Audio Electronics	3
MUE 410	Music Engineering Capstone Project (AWC)	3
MUE 436	Audio for Visual and Interactive Media (AWC)	3
MUE 501	Transducer Theory	3
MUE 502	Digital Audio Theory	3
MUE 503	Audio Software Development I	3
Select two of the following Advanced Music Engineering Electives:		6
MUE 361	Acoustics	
MUE 460	Recital Recording and Sound Reinforcement (Recording Services)	
MUE 465	Internship in Music Engineering (maximum of 3 credits total)	
MUE 504	Audio Software Development II (maximum of 3 credits total)	
MUE 505	Current Trends in Music Engineering I	
MUE 506	Current Trends in Music Engineering II	
MUE 508	Current Trends in Music Engineering III	
MUE 510	Computational Psychoacoustics	
MUE 511	Current Trends in Music Engineering IV	
MUE 521	Timbral Ear Training	
CCA 353	Post Production Sound Editing and Design	
ECE 201	Electrical Circuit Theory	3
ECE 203	Electrical Circuits Laboratory	1
PHY 221	University Physics I	3

MTH 162	Calculus II	4
<b>Courses in the Computer Engineering Minor</b>		
ECE 118	Introduction to Programming	3
ECE 211	Logic Design	3
ECE 212	Processors: Hardware, Software, and Interfacing	3
ECE 218	Data Structures	3
	Elective in Computer Engineering	3
	Elective in Computer Engineering	3
<b>Total Credit Hours</b>		<b>137</b>

<sup>1</sup> EMC core courses require a grade of "C" or higher. Lessons require a grade of "B- or higher.

<sup>2</sup> Only 1 credit of MUE 460 Recital Recording and Sound Reinforcement (Recording Services) per semester may count toward degree requirements. MUE 460 must be taken a minimum of 3 times to satisfy the Advanced MUE elective requirement, and may not be taken more than 3 times during the plan of study.

<sup>3</sup> MTH 161 Calculus I must be successfully completed before starting the fifth semester of study (by the end of the sophomore year). Exceptions by departmental consent only.

\* A minimum 2.7 TGPA is required to remain in the Music Engineering Technology program.

\*\* A minimum 2.0 TGPA is required in all Engineering courses taken.

## Curriculum Requirements with Electrical Engineering Minor

Code	Title	Credit Hours
<b>General Education Requirements</b>		
Written Communication Skills:		
WRS 105	First-Year Writing I	3
WRS 106	First-Year Writing II	3
Quantitative Skills:		
MTH 161	Calculus I <sup>3</sup>	4
Areas of Knowledge:		
Arts & Humanities Cognate (9 credits) (fulfilled through the major)		
People & Society Cognate		9
STEM Cognate (9 credits) (fulfilled through the Electrical Engineering minor)		
UMX 100	The University of Miami Experience	0
Advanced Writing and Communication Skills (3 courses) See details below.		
<b>Experiential Music Curriculum Core Courses MUE <sup>1</sup></b>		
MUE 13	Music Engineering Forum (8 semesters)	8
MXX XX1 (Level 1)	Principal Instrument Lesson & Studio Class (semesters 1-4, 2 credit hours)	8
MXX XX3 (Level 3)	Principal Instrument Lesson & Studio Class (semesters 5-6, 2 credit hours)	4
MTC/MSJ/MDE 140	Experiential Musicianship I	3
MTC/MSJ/MDE 141	Experiential Musicianship II	3
MTC/MSJ/MDE 240	Experiential Musicianship III	3
MTC/MSJ/MDE 241	Experiential Musicianship IV	3
MTC/MSJ/MDE 107	Skills Lab I (co-requisite MTC 140/MSJ 140/MDE 140)	1
MTC/MSJ/MDE 108	Skills Lab II (co-requisite MTC 141/MSJ 141/MDE 141)	1
MTC/MSJ/MDE 207	Skills Lab III (co-requisite MTC 240/MSJ 240/MDE 240)	1
MTC/MSJ/MDE 208	Skills Lab IV (co-requisite MTC 241/MSJ 241/MDE 241)	1
MKP 140	Keyboard Studies I (MSJ 103 if enrolled in MSJ theory)	1
MKP 141	Keyboard Studies II (MSJ 104 if enrolled in MSJ theory)	1
MCY 140	Experiencing Music	3
MCY 141	European Musical Traditions (AWC)	3
MUE 251	Electronic Production Techniques	3
MIN 310	Music Business and Entrepreneurship for Musicians	3

	Ensembles (semesters 1-6, 1 credit hour)	6
<b>Courses in the MUE Major</b>		
MUE 160	Audio Recording Workshop	3
MUE 220	Introduction to Music Recording	3
MUE 161	Audio Mixing Workshop	3
MUE 401	Audio Electronics (AWC)	3
MUE 436	Audio for Visual and Interactive Media	3
MUE 502	Digital Audio Theory	3
MUE 503	Audio Software Development I	3
MUE 501	Transducer Theory	3
MUE 410	Music Engineering Capstone Project (AWC)	3
Select two of the following Advanced Music Engineering Electives:		
MUE 361	Acoustics	
MUE 460	Recital Recording and Sound Reinforcement (Recording Services) (maximum of 3 credits total) <sup>2</sup>	
MUE 465	Internship in Music Engineering (maximum of 3 credits total)	
MUE 504	Audio Software Development II	
MUE 505	Current Trends in Music Engineering I	
MUE 506	Current Trends in Music Engineering II	
MUE 508	Current Trends in Music Engineering III	
MUE 510	Computational Psychoacoustics	
MUE 511	Current Trends in Music Engineering IV	
MUE 521	Timbral Ear Training	
CCA 353	Post Production Sound Editing and Design	
ECE 118	Introduction to Programming	3
ECE 218	Data Structures	3
MTH 162	Calculus II <sup>3</sup>	4
PHY 221	University Physics I	3
<b>Courses in the Electrical Engineering Minor</b>		
ECE 201	Electrical Circuit Theory	3
ECE 202	Electronics I	3
ECE 203	Electrical Circuits Laboratory	1
Elective in Electrical Engineering		3
Elective in Electrical Engineering		3
Elective in Electrical Engineering		3
<b>Total Credit Hours</b>		<b>137</b>

<sup>1</sup> EMC core courses require a grade of "C" or higher. Lessons require a grade of "B-" or higher.

<sup>2</sup> Only 1 credit of MUE 460 Recital Recording and Sound Reinforcement (Recording Services) per semester may count toward degree requirements. MUE 460 must be taken a minimum of 3 times to satisfy the Advanced MUE elective requirement, and may not be taken more than 3 times during the plan of study.

<sup>3</sup> MTH 161 Calculus I must be successfully completed before starting the fifth semester of study (by the end of the sophomore year). Exceptions by departmental consent only.

\* A minimum 2.7 TGPA is required to remain in the Music Engineering Technology program.

\*\* A minimum 2.0 TGPA is required in all Engineering courses taken.

## Advanced Writing and Communication Skills

### Courses

All students are required to successfully complete 3 Advanced Writing and Communication Skills (AWC) courses. Student degree requirements will include courses that meet the desired communication outcomes in evaluated and revised writing, speaking, stage presence, and audience engagement.

All music students will successfully complete:

1. MCY 141 Musical Trends and Traditions, which will include substantial evaluated and revised writing components.
2. MUE 410 Music Engineering Capstone Project which will include evaluated communication skills in attracting an audience, engaging an audience during performance, and preparing program notes or similar media as appropriate to the medium/venue.
3. MUE 401 Audio Electronics Audio Electronics, which will include discipline specific communication skills.

## Assessment

There will be at least 2 specific assessments in each Advanced Communications Skills course for communications or writing equivalent to 4000 words, evaluated and revised.

## Plan of Study with Minor in Computer Engineering

Year One		Credit Hours
<b>Fall</b>		
MUE 13	Music Engineering Forum	1
Principal Instrument/ Voice Lesson & Studio Class		2
MTC 140, MSJ 140, or MDE 140	Experiential Musicianship I or Experiential Musicianship I or Experiential Musicianship I	3
MTC 107, MSJ 107, or MDE 107	Skills Lab I or Skills Lab I or Skills Lab I	1
MKP 140 or MSJ 103	Keyboard Studies I or Jazz Piano I	1
Ensemble		1
MUE 220	Introduction to Music Recording	3
WRS 105	First-Year Writing I	3
MTH 161	Calculus I <sup>3</sup>	4
UMX 100	The University of Miami Experience	0
<b>Credit Hours</b>		<b>19</b>
<b>Spring</b>		
MUE 13	Music Engineering Forum	1
Principal Instrument/ Voice Lesson & Studio Class		2
MTC 141, MSJ 141, or MDE 141	Experiential Musicianship II or Experiential Musicianship II or Experiential Musicianship II	3
MTC 108, MSJ 108, or MDE 108	Skills Lab II or Skills Lab II or Skills Lab II	1
MKP 141 or MSJ 104	Keyboard Studies II or Jazz Piano II	1
Ensemble		1
MUE 160	Audio Recording Workshop	3
MTH 162	Calculus II	4
WRS 106 or ENG 106	First-Year Writing II or Writing About Literature and Culture	3
<b>Credit Hours</b>		<b>19</b>
<b>Year Two</b>		
<b>Fall</b>		
MUE 13	Music Engineering Forum	1
Principal Instrument/ Voice Lesson & Studio Class		2
MTC 240, MSJ 240, or MDE 240	Experiential Musicianship III or Experiential Musicianship III or Experiential Musicianship III	3

MTC 207, MSJ 207, or MDE 207	Skills Lab III or Skills Lab III or Skills Lab III: American Song Traditions	1
Ensemble		1
ECE 118	Introduction to Programming	3
ECE 201	Electrical Circuit Theory	3
PHY 221	University Physics I	3
<b>Credit Hours</b>		<b>17</b>
<b>Spring</b>		
MUE 13	Music Engineering Forum	1
Principal Instrument/ Voice Lesson & Studio Class		2
MTC 241, MSJ 241, or MDE 241	Experiential Musicianship IV or Experiential Musicianship IV or Experiential Musicianship IV	3
MTC 208, MSJ 208, or MDE 208	Skills Lab IV or Skills Lab IV or Skills Lab IV: American Song Traditions	1
Ensemble		1
MUE 161	Audio Mixing Workshop	3
ECE 218	Data Structures	3
MUE 401	Audio Electronics	3
ECE 203	Electrical Circuits Laboratory	1
<b>Credit Hours</b>		<b>18</b>
<b>Year Three</b>		
<b>Fall</b>		
MUE 13	Music Engineering Forum	1
Principal Instrument/ Voice Lesson & Studio Class		2
MCY 140	Experiencing Music	3
Ensemble		1
MUE 502	Digital Audio Theory	3
ECE 211	Logic Design	3
MUE 251	Electronic Production Techniques	3
<b>Credit Hours</b>		<b>16</b>
<b>Spring</b>		
MUE 13	Music Engineering Forum	1
Principal Instrument/ Voice Lesson & Studio Class		2
MCY 141	European Musical Traditions	3
Ensemble		1
MUE 436	Audio for Visual and Interactive Media	3
MUE 503	Audio Software Development I	3
Computer Engineering Minor Elective (1 of 2) <sup>1</sup>		3
<b>Credit Hours</b>		<b>16</b>
<b>Year Four</b>		
<b>Fall</b>		
MUE 13	Music Engineering Forum	1
MIN 310	Music Business and Entrepreneurship for Musicians	3
Advanced Music Engineering Elective	(see list below)	3
Computer Engineering Minor Elective (2 of 2) <sup>1</sup>		3
People & Society Cognate (1 of 3)		3
People & Society Cognate (2 of 3)		3
<b>Credit Hours</b>		<b>16</b>
<b>Spring</b>		
MUE 13	Music Engineering Forum	1

MUE 410	Music Engineering Capstone Project	3
MUE 501	Transducer Theory	3
ECE 212	Processors: Hardware, Software, and Interfacing	3
People & Society Cognate (3 of 3)		3
Advanced Music Engineering Elective	(see list below)	3
	<b>Credit Hours</b>	<b>16</b>
	<b>Total Credit Hours</b>	<b>137</b>

Code	Title	Credit Hours
<b>Advanced Music Engineering Electives</b>		
MUE 361	Acoustics	
MUE 460	Recital Recording and Sound Reinforcement (Recording Services) 2	
MUE 465	Internship in Music Engineering	
MUE 504	Audio Software Development II	
MUE 505	Current Trends in Music Engineering I	
MUE 506	Current Trends in Music Engineering II	
MUE 508	Current Trends in Music Engineering III	
MUE 510	Computational Psychoacoustics	
MUE 511	Current Trends in Music Engineering IV	
MUE 521	Timbral Ear Training	
CCA 353	Post Production Sound Editing and Design	

<sup>1</sup> *Computer Engineering Minor electives can be found on the Academic Bulletin: Minor in Computer Engineering (<https://bulletin.miami.edu/undergraduate-academic-programs/engineering/electrical-computer-engineering/computer-engineering-minor/#curriculumtext>) page.*

<sup>2</sup> *Only 1 credit of MUE 460 Recital Recording and Sound Reinforcement (Recording Services) per semester may count toward degree requirements. MUE 460 must be taken a minimum of 3 times to satisfy the Advanced MUE elective requirement, and may not be taken more than 3 times during the plan of study.*

<sup>3</sup> *MTH 161 Calculus I must be successfully completed before the end of the 4th semester of study.*

## Plan of Study with Minor in Electrical Engineering

Year One		Credit Hours
<b>Fall</b>		
MUE 13	Music Engineering Forum	1
Principal Instrument/ Voice Lesson & Studio Class		2
MTC 140, MSJ 140, or MDE 140	Experiential Musicianship I or Experiential Musicianship I or Experiential Musicianship I	3
MTC 107, MSJ 107, or MDE 107	Skills Lab I or Skills Lab I or Skills Lab I	1
MKP 140 or MSJ 103	Keyboard Studies I or Jazz Piano I	1
Ensemble		1
MTH 161	Calculus I <sup>3</sup>	4
MUE 220	Introduction to Music Recording	3
WRS 105	First-Year Writing I	3
UMX 100	The University of Miami Experience	0
	<b>Credit Hours</b>	<b>19</b>
<b>Spring</b>		
MUE 13	Music Engineering Forum	1
Principal Instrument/ Voice Lesson & Studio Class		2

MTC 141, MSJ 141, or MDE 141	Experiential Musicianship II or Experiential Musicianship II or Experiential Musicianship II	3
MTC 108, MSJ 108, or MDE 108	Skills Lab II or Skills Lab II or Skills Lab II	1
MKP 141 or MSJ 104	Keyboard Studies II or Jazz Piano II	1
Ensemble		1
MUE 160	Audio Recording Workshop	3
MTH 162	Calculus II	4
WRS 106 or ENG 106	First-Year Writing II or Writing About Literature and Culture	3
<b>Credit Hours</b>		<b>19</b>
<b>Year Two</b>		
<b>Fall</b>		
MUE 13	Music Engineering Forum	1
Principal Instrument/ Voice Lesson & Studio Class		2
MTC 240, MSJ 240, or MDE 240	Experiential Musicianship III or Experiential Musicianship III or Experiential Musicianship III	3
MTC 207, MSJ 207, or MDE 207	Skills Lab III or Skills Lab III or Skills Lab III: American Song Traditions	1
Ensemble		1
ECE 201	Electrical Circuit Theory	3
ECE 118	Introduction to Programming	3
PHY 221	University Physics I	3
<b>Credit Hours</b>		<b>17</b>
<b>Spring</b>		
MUE 13	Music Engineering Forum	1
Principal Instrument/ Voice Lesson & Studio Class		2
MTC 241, MSJ 241, or MDE 241	Experiential Musicianship IV or Experiential Musicianship IV or Experiential Musicianship IV	3
MTC 208, MSJ 208, or MDE 208	Skills Lab IV or Skills Lab IV or Skills Lab IV: American Song Traditions	1
Ensemble		1
MUE 161	Audio Mixing Workshop	3
ECE 203	Electrical Circuits Laboratory	1
MUE 401	Audio Electronics	3
Electrical Engineering Elective (1 of 3) <sup>1</sup>		3
<b>Credit Hours</b>		<b>18</b>
<b>Year Three</b>		
<b>Fall</b>		
MUE 13	Music Engineering Forum	1
Principal Instrument/ Voice Lesson & Studio Class		2
MCY 140	Experiencing Music	3
Ensemble		1
ECE 218	Data Structures	3
MUE 251	Electronic Production Techniques	3
MUE 502	Digital Audio Theory	3
<b>Credit Hours</b>		<b>16</b>



<b>Spring</b>		
MUE 13	Music Engineering Forum	1
Principal Instrument/ Voice Lesson & Studio Class		2
MCY 141	European Musical Traditions	3
Ensemble		1
ECE 202	Electronics I	3
MUE 436	Audio for Visual and Interactive Media	3
MUE 503	Audio Software Development I	3
<b>Credit Hours</b>		<b>16</b>
<b>Year Four</b>		
<b>Fall</b>		
MUE 13	Music Engineering Forum	1
MIN 310	Music Business and Entrepreneurship for Musicians	3
Advanced Music Engineering Elective (1 of 2)	(see list below)	3
Electrical Engineering Minor Elective (2 of 3) <sup>1</sup>		3
People & Society Cognate (1 of 3)		3
People & Society Cognate (2 of 3)		3
<b>Credit Hours</b>		<b>16</b>
<b>Spring</b>		
MUE 13	Music Engineering Forum	1
MUE 410	Music Engineering Capstone Project	3
MUE 501	Transducer Theory	3
Advanced Music Engineering Elective (2 of 2)	(see list below)	3
Electrical Engineering Minor Elective (3 of 3) <sup>1</sup>		3
People & Society Cognate (3 of 3)		3
<b>Credit Hours</b>		<b>16</b>
<b>Total Credit Hours</b>		<b>137</b>

Code	Title	Credit Hours
<b>Advanced Music Engineering Electives</b>		
MUE 361	Acoustics	
MUE 460	Recital Recording and Sound Reinforcement (Recording Services) <sup>2</sup>	
MUE 465	Internship in Music Engineering	
MUE 504	Audio Software Development II	
MUE 505	Current Trends in Music Engineering I	
MUE 506	Current Trends in Music Engineering II	
MUE 508	Current Trends in Music Engineering III	
MUE 510	Computational Psychoacoustics	
MUE 511	Current Trends in Music Engineering IV	
MUE 521	Timbral Ear Training	
CCA 353	Post Production Sound Editing and Design	

<sup>1</sup> *Electrical Engineering Minor electives can be found on the Academic Bulletin: Minor in Electrical Engineering (<https://bulletin.miami.edu/undergraduate-academic-programs/engineering/electrical-computer-engineering/electrical-engineering-minor/#curriculumtext>) page.*

<sup>2</sup> *Only 1 credit of MUE 460 Recital Recording and Sound Reinforcement (Recording Services) per semester may count toward degree requirements. MUE 460 must be taken a minimum of 3 times to satisfy the Advanced MUE elective requirement, and may not be taken more than 3 times during the plan of study.*

<sup>3</sup> *MTH 161 Calculus I must be successfully completed before the end of the 4th semester of study.*

## **Mission**

The mission of the Music Engineering Technology program is to:

- Provide the highest quality education in the field of music engineering.
- Promote advancements in the fidelity and creativity of music recording, production and reproduction.
- Promote advancements in the invention, design and implementation of audio hardware and software.

## **Goals**

- Understanding the theoretical basis of sound recording, processing and reproduction.
- Understanding the practice techniques used in sound recording, processing and reproduction.
- Designing and implementing original audio hardware and/or software.
- Understanding the principles of computer science (Bachelor of Music) or electrical engineering (Bachelor of Science).

## **Student Learning Outcomes**

- Students will use problem solving skills to find a solution to a music engineering problem.
- Students will demonstrate theoretical understanding and practical techniques utilized in sound recording, processing and reproduction.
- Students will demonstrate understanding of electrical and computer engineering concepts and applications.