

BACHELOR OF SCIENCE IN MUSIC TECHNOLOGY - ELECTRICAL AND COMPUTER ENGINEERING: SIGNAL PROCESSING

The Bachelor of Science in Music Technology teaches students the fundamentals of musicianship and audio technology. Students learn to create new music with technology, develop new technologies for making music, and conduct scientific research that expands our knowledge of how both humans and machines engage with music. Student projects span areas such as robotic musicianship, music informatics, brain music, and computational and cognitive musicology.

Bachelor of Science in Music Technology students will need to consult with the undergraduate advisor to choose a concentration or minor.

The Electrical and Computer Engineering Track allows students to develop in-depth audio engineering and/or signal processing skills as applied to music technology. The processing of analog and digital signals is one of the core areas of music technology and related to fields such as music information retrieval, audio effects, and sound synthesis. Students use their Breadth Block to take prescribed coursework in the School of Electrical and Computer Engineering.

Code	Title	Credit Hours
Wellness		
APPH 1040	Scientific Foundations of Health	2
	or APPH 10 The Science of Physical Activity and Health	
	or APPH 10 Flourishing: Strategies for Well-being and Resilience	
Core A - Essential Skills		
ENGL 1101	English Composition I	3
ENGL 1102	English Composition II	3
MATH 1552	Integral Calculus	4
Core B - Institutional Options		
CS 1371	Computing for Engineers	3
	or CS 1301 Introduction to Computing	
	or CS 1315 Introduction to Media Computation	
Core C - Humanities		
Any HUM		6
Core D - Science, Math, & Technology		
PHYS 2211	Introductory Physics I	4
PHYS 2212	Introductory Physics II	4
MATH 1551	Differential Calculus	2
MATH 1553	Introduction to Linear Algebra	2
Core E - Social Sciences		
HIST 2111	The United States to 1877	3
	or HIST 2112 The United States since 1877	
	or INTA 1200 American Government in Comparative Perspective	
	or POL 1101 Government of the United States	
	or PUBP 3000 American Constitutional Issues	

ECON 2100	Economic Analysis and Policy Problems	3
	or ECON 2101 The Global Economy	
	or ECON 2102 Principles of Macroeconomics	
	or ECON 2103 Principles of Microeconomics	
Any SS		6
Core F - Courses Related to Major		
MUSI 2010	Fundamentals of Musicianship I	3
MUSI 2011	Fundamentals of Musicianship II	3
MUSI 2012	Fundamentals of Musicianship III	3
MUSI 2013	Fundamentals of Musicianship IV	3
MUSI 2015	Laptop Orchestra	3
MUSI 2525	Introduction Audio Technology I	3
MUSI Ensemble Requirement	¹	
Major Requirements		
MUSI 2526	Introduction to Audio Technology II	3
MUSI 4630	Music Recording and Mixing	3
MUSI 3770	Project Studio: Technology ²	4
MUSI 3771	Project Studio: Analysis ²	4
MUSI 4677	Music Perception and Cognition	3
MUSI Upper Division Elective ²		3
Choose one from the following for MUSI Upper Division Elective:		3
MUSI 4450	Integrating Music Into Multimedia	
MUSI 4456	Music Technology History and Repertoire	
	or MUSI 4457 Music Technology History and Repertoire	
MUSI 4457	Computational Music and Audio Analysis	
	or MUSI 4458 Audio Content Analysis	
MUSI 4458	Computer Music Composition	
	or MUSI 4459 Computer Music Composition	
MUSI 4459	Digital Signal Processing for Music	
	or MUSI 4460 Digital Signal Processing for Music Analysis and Synthesis	
MUSI 4705	Music Technology Capstone I	4
MUSI 4706	Music Technology Capstone II	4
Concentration: ECE/Signal Processing		
MATH 2552	Differential Equations	4
ECE 2026	Introduction to Signal Processing	3
ECE 3710	Circuits and Electronics	2
ECE 3084	Signals and Systems	3
ECE 3741	Instrumentation and Electronics Lab	1
Select 6 hours:		6
ECE 4270	Fundamentals of Digital Signal Processing	
ECE 4271	Applications of Digital Signal Processing	
ECE 4445	Audio Engineering	
ECE 4446	Audio Engineering Laboratory	
ECE 4450	Analog Circuits for Music Synthesis	
Free Electives		
Free Electives		9
Total Credit Hours		122

¹ Students are required to satisfy a 4-course music ensemble requirement. Course options include any four courses from the following list: MUSI 3018 or MUSI 3019 or MUSI 3121 or MUSI 3131 or

MUSI 3231 or MUSI 3241 or MUSI 3251 or MUSI 3261 or MUSI 3311 or MUSI 3321 or MUSI 3411 or MUSI 3511 or MUSI 3531 or MUSI 3541 or MUSI 3551 or MUSI 3611. The courses may be used as Humanities (if course has been approved for Humanities credit) and/or free electives.

² Music Technology majors can choose one of two pathways to use VIP participation to fulfill degree requirements.

(1) The VIP Project Studio Pathway: Students participate in an advisor-approved VIP team to fulfill their MUSI 3770 or MUSI 3771 Project Studio requirement as well as an upper-division music technology elective and free electives. This pathway requires 5 or 6 semesters of participation in the VIP program, typically beginning in the sophomore year, as follows:

- **Year 1 (typically sophomore):** At least 1 credit on any VIP team. (The team can change each semester to help find a good match.) These credits will count as free-electives.
- **Year 2 (typically junior):** 2 credits per semester on an advisor-approved VIP team, counted as either 4 MUSI 3770 or 4 MUSI 3771 credits. The team must be the same both semesters and is preferably the same VIP team as in Year 1. An academic advisor in the School of Music must approve the team as meeting learning objectives for MUSI 3770 or 3771. The advisor will determine whether 3770 or 3771 is the most appropriate match.
- **Year 3 (typically senior):** 2 credits each semester on the same VIP team as in Year 2. 3 of these credits count as a Music Technology upper-division elective. 1 credit counts as a free elective.
- Any additional VIP credits beyond these count as additional free electives.

(2) The VIP Elective Pathway: Students participate in any VIP team to fulfill an upper-division music technology elective and free electives.

- Participating in the same VIP team for five or fewer credits results in that many free-elective credits.
- Participating in the same VIP team for 6 or more credits results in 3 credits that are counted as upper division Music Technology electives and 3 credits that are counted as free electives.
- Any additional credits count as free electives.
- Any VIP team is eligible for this pathway. No approval is required by an academic advisor in music technology.