

# BACHELOR OF SCIENCE IN MUSIC TECHNOLOGY - MECHANICAL ENGINEERING: CONTROLS AND ROBOTICS

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 Mechanical Engineering Track allows students to develop in-depth mechanical engineering skills as applied to music technology. Mechanical engineering is directly related to music technology fields in the areas of robotic musicianship, acoustics, and instrument design. Students use their Breadth Block to take prescribed credit hours of coursework in the School of Mechanical Engineering focusing on one of the two options below:

Option 1: Acoustics and Vibrations

Option 2: Controls and Robotics

Code	Title	Credit Hours
<b>Wellness</b>		
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	
<b>Core A - Essential Skills</b>		
ENGL 1101	English Composition I	3
ENGL 1102	English Composition II	3
MATH 1552	Integral Calculus	4
<b>Core B - Institutional Options</b>		
CS 1371	Computing for Engineers	3
<b>Core C - Humanities</b>		
Any HUM		6
<b>Core D - Science, Math, &amp; Technology</b>		
PHYS 2211	Introductory Physics I	4
PHYS 2212	Introductory Physics II	4
MATH 1551	Differential Calculus	2
MATH 1553	Introduction to Linear Algebra	2
<b>Core E - Social Sciences</b>		
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 21 The Global Economy	
	or ECON 21 Principles of Macroeconomics	
	or ECON 21 Principles of Microeconomics	
Any SS		6
<b>Core F - Courses Related to Major</b>		
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	<sup>1</sup>	
<b>Major Requirements</b>		
MUSI 2526	Introduction to Audio Technology II	3
MUSI 4630	Music Recording and Mixing	3
MUSI 3770	Project Studio: Technology <sup>2</sup>	4
MUSI 3771	Project Studio: Analysis <sup>2</sup>	4
MUSI 4677	Music Perception and Cognition	3
MUSI Upper Division Elective	<sup>2</sup>	3
Choose one from the following for MUSI Upper Division Elective:		
MUSI 4450	Integrating Music Into Multimedia	
MUSI 4456	Music Technology History and Repertoire	
	or MUSI 4456 Music Technology History and Repertoire	
MUSI 4457	Computational Music and Audio Analysis	
	or MUSI 4457 Computational Music and Audio Analysis	
MUSI 4458	Computer Music Composition	
	or MUSI 4458 Computer Music Composition	
MUSI 4459	Digital Signal Processing for Music	
	or MUSI 4459 Digital Signal Processing for Music Analysis and Synthesis	
MUSI 4705	Music Technology Capstone I	4
MUSI 4706	Music Technology Capstone II	4
<b>Concentration: ME/Controls and Robotics</b>		
MATH 2552	Differential Equations	4
ECE 3710	Circuits and Electronics	2
COE 2001	Statics	2
ME 2202	Dynamics of Rigid Bodies	3
ME 3017	System Dynamics	3
ME 4189	Structural Vibrations	3
ME 4451	Robotics	3
	or ME 4012 Modeling and Control of Motion Systems	
	or ME 4405 Fundamentals of Mechatronics	
ME 4452	Control of Dynamic Systems	3
<b>Free Electives</b>		
Free Electives		8
<b>Total Credit Hours</b>		<b>122</b>

<sup>1</sup> 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.

<sup>2</sup> 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.