

# 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 |
|--|--|--------------|
| <b>Wellness Requirement</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 IMPACTS</b>                          |  |              |
| <b>Institutional Priority</b>                |  |              |
| CS 1371                                      | Computing for Engineers  | 3            |
|  | or CS 1301 Introduction to Computing                             |              |
|  | or CS 1315 Introduction to Media Computation                     |              |
| <b>Mathematics and Quantitative Skills</b>   |  |              |
| MATH 1552                                    | Integral Calculus  | 4            |
| <b>Political Science and U.S. History</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                      |              |
| <b>Arts, Humanities, and Ethics</b>          |  |              |
| Any HUM                                      |  | 6            |
| <b>Communicating in Writing</b>              |  |              |
| ENGL 1101                                    | English Composition I  | 3            |
| ENGL 1102                                    | English Composition II   | 3            |
| <b>Technology, Mathematics, and Sciences</b> |  |              |
| Any Lab Science <sup>1</sup>                 |  | 8            |
| MATH 1551                                    | Differential Calculus  | 2            |

|  |   |            |
|--|---|------------|
| MATH 1553  | Introduction to Linear Algebra            | 2          |
| <b>Social Sciences</b>   |   |            |
| Any SS   |   | 9          |
| <b>Field of Study</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          |
| <b>Major Requirements</b>  |   |            |
| MUSI Ensemble Requirement <sup>2</sup>   |   |            |
| MUSI 2526  | Introduction to Audio Technology II       | 3          |
| MUSI 4630  | Music Recording and Mixing                | 3          |
| MUSI 3770  | Project Studio: Technology <sup>3</sup>   | 4          |
| MUSI 4677  | Music Perception and Cognition            | 3          |
| MUSI Upper Division (4000-level) Elective <sup>3</sup>                                   |   |            |
| MUSI 4705  | Music Technology Capstone I               | 4          |
| MUSI Additional Electives (any MUSI 4000-level courses or ensemble courses) <sup>2</sup> |   |            |
| <b>Concentration: ECE/Signal Processing</b>  |   |            |
| MATH 2552  | Differential Equations                    | 4          |
| ECE 2026   | Introduction to Signal Processing         | 3          |
| ECE 3084   | Signals and Systems                       | 3          |
| ECE 3710   | Circuits and Electronics                  | 2          |
| ECE 3741   | Instrumentation and Electronics Lab       | 1          |
| ECE 4270   | Fundamentals of Digital Signal Processing | 3          |
| ECE 4271   | Applications of Digital Signal Processing | 4          |
| ECE 4445   | Audio Engineering                         | 3          |
| <b>Free Electives</b>  |   |            |
| Free Electives   |   | 8          |
| <b>Total Credit Hours</b>  |   | <b>122</b> |

<sup>1</sup> Students are highly encouraged to enroll in PHYS 2211 and PHYS 2212.

<sup>2</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 Core IMPACTS Arts, Ethics and Humanities (if course has been approved for Humanities credit) and/or free electives.

<sup>3</sup> Music Technology majors can choose one pathway to use VIP participation to fulfill degree requirements.

**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.