

# Computer Science and Music with Concentration in Music Technology, BS

The computer science and music combined major with concentration in music technology focuses on the creative application of sound and music technologies to a broad range of artistic, social, and industrial purposes. An emphasis is maintained throughout on imaginative exploration, collaboration across disciplines, and real-world experience. It is designed to give students a firm foundation in music and computing for digital audio technologies. This program is recommended for students with a strong background in music prior to entering Northeastern.

## Program Requirements

- Concentrations and course offerings may vary by campus and/or by program modality. Please consult with your advisor or admissions coach for the course availability each term at your campus or within your program modality.
- Certain options within the program may be *required* at certain campuses or for certain program modalities. Please consult with your advisor or admissions coach for requirements at your campus or for your program modality.

Complete all courses listed below unless otherwise indicated. Also complete any corequisite labs, recitations, clinicals, or tools courses where specified and complete any additional courses needed beyond specific college and major requirements to satisfy graduation credit requirements.

## Universitywide Requirements

All undergraduate students are required to complete the Universitywide Requirements (<https://catalog.northeastern.edu/undergraduate/university-academics/university-wide-requirements/>).

## NUpath Requirements

All undergraduate students are required to complete the NUpath Requirements (<https://catalog.northeastern.edu/undergraduate/university-academics/nupath/>).

## Computer Science Courses

| Code   | Title   | Hours |
|--|---|-------|
| <b>Computer Science Overview</b>                   |   |       |
| Must be taken in alignment with your home college: |   |       |
| CS 1200<br>or MUSC 1000                            | First Year Seminar<br>Music at Northeastern                                     | 1     |
| CS 1210<br>or EEAM 2000                            | Professional Development for Khoury Co-op<br>Professional Development for Co-op | 1     |
| <b>Computer Science Fundamental Courses</b>        |   |       |
| CS 1800<br>and CS 1802                             | Discrete Structures<br>and Seminar for CS 1800                                  | 5     |
| CS 2500<br>and CS 2501                             | Fundamentals of Computer Science 1<br>and Lab for CS 2500                       | 5     |
| CS 2510<br>and CS 2511                             | Fundamentals of Computer Science 2<br>and Lab for CS 2510                       | 5     |
| <b>Computer Science Required Courses</b>           |   |       |
| CS 3000  | Algorithms and Data   | 4     |
| CS 3200  | Introduction to Databases   | 4     |
| CS 3500<br>and CS 3501                             | Object-Oriented Design<br>and Lab for CS 3500                                   | 5     |
| CS 4500<br>or CS 4530                              | Software Development<br>Fundamentals of Software Engineering                    | 4     |
| IS 4300  | Human Computer Interaction (Integrative)  | 4     |

## Khoury Elective

With advisor approval, directed study, research, project study, and appropriate graduate-level courses may also be taken as upper-division electives.

Complete 8 semester hours of CS, CY, DS or IS classes that are not already required. Choose courses within the following ranges:

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CS 2500 or higher, except CS 5010

CY 2000 or higher, except CY 4930

DS 2500 or higher, except DS 4900

IS 2000 or higher, except IS 4900

## Music Courses

| Code   | Title   | Hours |
|--|---|-------|
| <b>Music Theory Placement</b>  |   |       |
| All students must take a music theory placement exam. Students who successfully complete a music theory placement exam may substitute a general elective for the MUSC 1119 requirement. Students who do not place into MUSC 1201 must first take the following course: |   |       |
| MUSC 1119  | Fundamentals of Western Music Theory                            | 4     |
| <b>Music Theory and Composition</b>  |   |       |
| MUSC 1201  | Music Theory 1  | 4     |
| MUSC 1202  | Music Theory 2  | 4     |
| Complete one of the following:   |   |       |
| MUSC 2111  | Algebra and Geometry of Music                                   | 4     |
| MUSC 3300  | Music Perception and Cognition (Music Perception and Cognition) | 4     |
| MUSC 3541  | Music Analysis Seminar  | 4     |
| <b>Music in Context</b>  |   |       |
| Select one of the following for four semester hours:   |   |       |
| MUSC 1001  | Music in Everyday Life  | 4     |
| MUSC 1002 and MUSC 1003  | Music in Everyday Life and Lab for MUSC 1002                    | 4     |
| <b>Contemporary / Popular Music</b>  |   |       |
| Complete one of the following:   |   |       |
| MUSC 2101  | Black Popular Music   | 4     |
| MUSC 2150  | Making a Musical: Analysis, Craft, and Creation                 | 4     |
| MUSC 2310  | Popular Music Since 1945  | 4     |
| MUSC 2311  | Topics in American Music  | 4     |
| MUSC 2317  | Punk Rock   | 4     |
| MUSC 2320  | 40,000 Years of Music Technology                                | 4     |
| MUSC 2336  | The Festival Experience   | 4     |
| MUSC 2340  | Divas, DJs, and Double Standards                                | 4     |
| MUSC 2351  | Music, Sound, and the Screen                                    | 4     |
| MUSC 2380  | The World of Choral Music                                       | 4     |
| MUSC 3352  | Sounding Human  | 4     |
| MUSC 3353  | Music and the Racial Imagination                                | 4     |
| MUSC 3354  | Sound and the Sacred  | 4     |
| MUSI 3360  | Global Music Industries in Context                              | 4     |
| MUSI 3401  | Hip Hop in the Music Industry                                   | 4     |
| <b>Music Technology</b>  |   |       |
| MUSC 2350  | Acoustics and Psychoacoustics of Music                          | 4     |
| MUST 1220  | Introduction to Music Technology                                | 4     |
| MUST 2102  | Composing with Digital Technologies                             | 4     |
| MUST 2431  | Computer Music Fundamentals                                     | 4     |
| <b>Music Industry</b>  |   |       |
| Complete one of the following:   |   |       |
| MUSI 1230  | Introduction to Music Industry                                  | 4     |
| MUSI 2331  | Music Production and Recording 2                                | 4     |
| <b>Music Technology Electives</b>  |   |       |
| Complete two of the following:   |   |       |

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|           |  |  |
|-----------|--|--|
| MUSC 4510 | Music and the Brain Research             |  |
| MUST 3300 | Musical Interactions in Extended Reality |  |
| MUST 3601 | Digital Audio Signal Processing          |  |
| MUST 3602 | Electronics for Music                    |  |
| MUST 3603 | Embedded Audio Programming               |  |
| MUST 3973 | Special Topics in Music Technology       |  |
| MUST 4610 | Composition for Electronic Instruments   |  |
| MUST 5973 | Special Topics in Music Technology       |  |

**Music Technology Capstone**

|           |                           |   |
|-----------|---------------------------|---|
| MUST 4611 | Music Technology Capstone | 4 |
|-----------|---------------------------|---|

**Foundations of Psychology**

| Code      | Title                     | Hours |
|-----------|---------------------------|-------|
| PSYC 1101 | Foundations of Psychology | 4     |

**Computing and Social Issues**

| Code                           | Title   | Hours |
|--------------------------------|---|-------|
| Complete one of the following: |   |       |
| AFCS 2600                      | Issues in Race, Science, and Technology                         |       |
| CY 4170                        | The Law, Ethics, and Policy of Data and Digital Technologies    |       |
| CY 5240                        | Cyberlaw: Privacy, Ethics, and Digital Rights                   |       |
| HIST 2220                      | History of Technology   |       |
| INSH 2102                      | Bostonography: The City through Data, Texts, Maps, and Networks |       |
| IS 1300<br>or PHIL 1300        | Knowledge in a Digital World                                    |       |
| PHIL 1145                      | Technology and Human Values                                     |       |
| SOCL 1280                      | The Twenty-First-Century Workplace                              |       |
| SOCL 2485                      | Environment, Technology, and Society                            |       |
| SOCL 4528                      | Technology and Society  |       |

**Computer Science Writing Requirement**

| Code                                       | Title   | Hours |
|--|---|-------|
| <b>College Writing</b>                     |   |       |
| ENGW 1111                                  | First-Year Writing  | 4     |
| <b>Advanced Writing in the Disciplines</b> |   |       |
| ENGW 3302<br>or ENGW 3314<br>or ENGW 3315  | Advanced Writing in the Technical Professions<br>Advanced Writing in the Arts, Media, and Design<br>Interdisciplinary Advanced Writing in the Disciplines | 4     |

**Required General Electives**

| Code   | Title | Hours |
|--|-------|-------|
| Complete 16 semester hours of general electives. |       | 16    |

**NUpath Requirements Satisfied**

- Engaging with the Natural and Designed World
- Exploring Creative Expression and Innovation
- Interpreting Culture
- Conducting Formal and Quantitative Reasoning
- Understanding Societies and Institutions
- Analyzing and Using Data
- Writing in the First Year
- Advanced Writing in the Disciplines
- Writing-Intensive in the Major
- Demonstrating Thought and Action in a Capstone

Integrating Knowledge and Skills Through Experience is satisfied through co-op.

### Khoury College GPA Requirement

Minimum cumulative 2.000 GPA required in all CS, CY, DS, and IS courses

### Music Technology Grade Requirement

Students must maintain at least a 2.667 GPA (B- average) in the requirements of the music half of the combined major (MUSC, MUSI, and MUST courses) and also complete all required music courses with grades of at least C. Students who fail to meet the above standards will be placed on departmental probation; those who remain on probation for two consecutive semesters will be dropped from the major.

### Program Requirement

133 total semester hours required

### Plan of Study

#### Sample Plan of Study:

#### Four Years, Two Co-ops in Spring/Summer 1

| Year 1   |           |                           |           |                          |          |                          |       |          |
|--|-----------|---------------------------|-----------|--------------------------|----------|--------------------------|-------|----------|
| Fall   | Hours     | Spring                    | Hours     | Summer 1                 | Hours    | Summer 2                 | Hours | Hours    |
| CS 1200  |           | 1 CS 2510<br>and CS 2511  |           | 5 CS 3500<br>and CS 3501 |          | 5 Elective               |       | 4        |
| CS 1800<br>and CS 1802                         | 5         | MUSC 1202 <sup>1</sup>    | 4         | PSYC 1101                | 4        | Elective                 | 4     | 4        |
| CS 2500<br>and CS 2501                         | 5         | MUSC 2350                 | 4         |                          |          |                          |       |          |
| ENGW 1111                                      | 4         | MUST 1220 <sup>1</sup>    | 4         |                          |          |                          |       |          |
| MUSC 1201 <sup>1</sup>                         | 4         |                           |           |                          |          |                          |       |          |
|  | <b>19</b> |                           | <b>17</b> |                          |          | <b>9</b>                 |       | <b>8</b> |
| Year 2   |           |                           |           |                          |          |                          |       |          |
| Fall   | Hours     | Spring                    | Hours     | Summer 1                 | Hours    | Summer 2                 | Hours | Hours    |
| CS 1210  | 1         | Co-op                     | 0         | Co-op                    | 0        | ENGW 3302, 3314, or 3315 | 4     | 4        |
| CS 3000  | 4         |                           |           |                          |          | Elective                 | 4     | 4        |
| CS 3200  | 4         |                           |           |                          |          |                          |       |          |
| MUSC 1001 or 1002 <i>and</i><br>1003           | 4         |                           |           |                          |          |                          |       |          |
| MUST 2431                                      | 4         |                           |           |                          |          |                          |       |          |
|  | <b>17</b> |                           | <b>0</b>  |                          | <b>0</b> |                          |       | <b>8</b> |
| Year 3   |           |                           |           |                          |          |                          |       |          |
| Fall   | Hours     | Spring                    | Hours     | Summer 1                 | Hours    | Summer 2                 | Hours | Hours    |
| MUSC 2111, 3541, or 3300                       | 4         | Co-op                     | 0         | Co-op                    | 0        | Elective                 | 4     | 4        |
| Contemporary music<br>requirement <sup>1</sup> | 4         |                           |           |                          |          | Elective                 | 4     | 4        |
| Khoury Elective                                | 4         |                           |           |                          |          |                          |       |          |
| Music technology elective <sup>1</sup>         | 4         |                           |           |                          |          |                          |       |          |
|  | <b>16</b> |                           | <b>0</b>  |                          | <b>0</b> |                          |       | <b>8</b> |
| Year 4   |           |                           |           |                          |          |                          |       |          |
| Fall   | Hours     | Spring                    | Hours     | Summer 1                 | Hours    | Summer 2                 | Hours | Hours    |
| CS 4500 or 4530                                | 4         | IS 4300                   | 4         |                          |          |                          |       |          |
| MUST 2102                                      | 4         | MUST 4611 <sup>1</sup>    | 4         |                          |          |                          |       |          |
| Computing and Social<br>Issues                 | 4         | Music industry elective   | 4         |                          |          |                          |       |          |
| Khoury elective                                | 4         | Music technology elective | 4         |                          |          |                          |       |          |
|  | <b>16</b> |                           | <b>16</b> |                          |          |                          |       |          |

**Total Hours: 134**

<sup>1</sup> Indicates course must be taken in the term listed.