

# COMPUTING AND THE ARTS

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Computing and the Arts is an interdepartmental major designed for students who wish to integrate work in computing with work in one of five arts disciplines: architecture, art, history of art, music, or theater studies.

For students with a computing perspective, issues in these disciplines present interesting and substantive problems: how musicians use computers to compose; the limitations of current software tools used by artists; the types of analyses done by art historians; challenges in designing and using virtual sets in the theater; ways that virtual worlds might help to envision new forms of artistic expression; and lessons that can be learned from trying to create a robotic conductor or performer.

For students with an artistic perspective, computing methods offer a systematic approach to achieving their vision. A foundation in computer science allows artists to understand existing computing tools more comprehensively and to use them more effectively. Furthermore, it gives them insight into what fundamentally can and cannot be done with computers, so they can anticipate the future development of new tools for computing in their field.

## PREREQUISITES

The prerequisite for all students in the major is either CPSC 100 or CPSC 112, which should be taken during the first year. There are two additional prerequisites for the Art concentration, ART 111 and 114. There are two additional prerequisites for the Theater, Dance, and Performance Studies concentration, THST 110 and 111. There are no additional prerequisites for the Architecture, History of Art, or Music concentrations. There is no required favorable review of studio work for admission to the major in any concentration, but a sophomore review advising session is required for the Art concentration.

## REQUIREMENTS OF THE MAJOR

Twelve term courses are required beyond the prerequisites, not including the two-term senior project. Six of the courses must be in Computer Science, including CPSC 201, 202, and 223. Students are advised to complete CPSC 202 and 223 by the end of the sophomore year. MATH 244 may be substituted for CPSC 202. The six remaining courses are selected from one of the arts disciplines. Students choose a concentration in architecture, art, history of art, music, or theater, dance, and performance studies. All requirements for a single concentration must be satisfied, as specified below.

*The Architecture concentration* requires the following courses in addition to the Computer Science courses listed above: (1) ARCH 150 and 200; (2) two courses from ARCH 260, 312, 360, and 362; (3) two elective courses from either of the two Architecture specific concentrations: Design; or History, Theory, Criticism of Architecture, and Urbanism; (4) two courses from CPSC 376, 437, 446, 451, 475, 478, 479, or 484; and (5) one additional intermediate or advanced CPSC course (excluding CPSC 490).

*The Art concentration* requires the following courses in addition to the Computer Science courses listed above, as well as a sophomore review at the School of Art: (1) two 100-

level courses beyond ART 111 and 114, such as ART 132 and/or 184 or 185; (2) two courses in Art at the 200 or 300 level, such as ART 285 and/or 370; (3) ART 395; (4) one course in Art at the 400 level, such as ART 495; (5) two courses selected from CPSC 376, 437, 446, 451, 475, 478, 479, or 484; (6) one additional intermediate or advanced Computer Science course (excluding CPSC 490). Seniors following the art concentration will have access to a shared studio and many facilities in the School of Art.

*The History of Art concentration* requires the following courses in addition to the Computer Science courses listed above: (1) one introductory, 100-level, History of Art course; (2) two History of Art courses at the 200, 300, or 400 level (the courses must represent two different areas as defined in the History of Art program description); (3) one studio art course (students may need to take a prerequisite course in Art to prepare for the studio course); (4) HSAR 401; (5) one 400-level seminar in History of Art; (6) two courses selected from CPSC 376, 437, 451, 475, 478, or 479, one of which must be CPSC 478 or 479; (7) one additional intermediate or advanced Computer Science course (excluding CPSC 490).

*The Music concentration* requires the following courses in addition to the Computer Science courses listed above: (1) two courses from *Group I* (Music Theory); (2) three additional courses from *Group I* or *Group II* (Creative Practices); (3) one course from *Group III* (Western Art Music) or *Group IV* (World and Popular Music); (4) CPSC 431; (5) CPSC 432; (6) one additional intermediate or advanced Computer Science course (excluding CPSC 490).

*The Theater, Dance, and Performance Studies concentration* requires the following courses in addition to the prerequisites and Computer Science courses listed above: (1) one course in the Artistic Practice domain; (2) one course in the Histories domain; (3) one course in the Performance Theory domain; (4) one course in the Interarts domain; (5) two additional courses in any of the domains; (6) CPSC 431 or 432; (7) CPSC 478, 479, or 484; (8) one additional intermediate or advanced Computer Science course (excluding CPSC 490).

**Credit/D/Fail** Courses taken Credit/D/Fail may not be counted toward the major.

**Searchable attributes:** YC CPAR: ARCH CS Elective; YC CPAR: ART CS Elective, YC CPAR: HSAR CS Elective, YC CPAR: MUSI Elective, YC CPAR: THST CS Elective

## SENIOR REQUIREMENT

The senior project requires two terms: one term of CPSC 490, and one term of ARCH 491, ART 496, HSAR 499, one from MUSI 496–499, or one from THST 471, 491 or 492, depending on the concentration chosen. The project must be approved by the DUS and be acceptable to both departments. Students must submit a written report, including an electronic abstract and webpage(s).

## ADVISING AND APPROVAL OF PROGRAM

The entire program of each student majoring in Computing and the Arts must be approved by the DUS.

## SUMMARY OF MAJOR REQUIREMENTS

**Prerequisites** *All concentrations*—CPSC 100 or CPSC 112; *Art concentration*—ART 111, 114, and sophomore review; *Theater, Dance, and Performance Studies concentration*—THST 110, 111

**Number of courses** 12 term courses beyond prereqs (not incl senior project)

**Specific courses required** *All concentrations*—CPSC 201, 202, 223; *Architecture*—ARCH 150, 200; 2 courses from ARCH 260, 312, 360, 362; *Art*—ART 395; *History of Art*—HSAR 401; *Music*—CPSC 431, 432; *Theater, Dance, and Performance Studies*—CPSC 431 or 432; CPSC 478, 479, or 484

**Distribution of courses** *All concentrations*—3 addtl courses in Comp Sci as specified for each concentration, to incl 1 intermediate or advanced course (excluding CPSC 490); *Architecture*—2 courses from the Architecture specific concentrations, as specified; *Art*—2 courses in Art at 100 level (excluding prereqs), 2 courses at 200 or 300 level, and 1 at 400 level as specified; *History of Art*—1 intro, 100-level course; 2 courses in different areas of History of Art at 200, 300, or 400 level, as specified; 1 sem at 400-level in History of Art; 1 studio art course; *Music*—2 courses from *Group I* (Music Theory); 3 courses from *Group I* or *Group II* (Creative Practices); (3) one course from *Group III* (Western Art Music) or *Group IV* (World and Popular Music); *Theater, Dance, and Performance Studies*—1 course in each of 4 domains; 2 additional courses in any domain

**Substitution permitted** MATH 244 for CPSC 202

**Senior requirement** *All concentrations*—Two-term senior project including CPSC 490, approved by DUS; *Architecture*—ARCH 491; *Art*—ART 496; *History of Art*—HSAR 499; *Music*—one from MUSI 496–499; *Theater, Dance, and Performance Studies*—THST 471, 491 or 492

### Prerequisite for all concentrations

- CPSC 100 or CPSC 112

### Prerequisite for Art concentration

- ART 111
- ART 114
- Sophomore review

### Prerequisite for Theater, Dance, and Performance Studies concentration

- THST 110
- THST 111

### Requirements for all concentrations

12 courses (for 12 credits) beyond the prerequisites (not including the senior project)

students fulfill the requirements for one concentration

- 6 computer science courses to include:
  - CPSC 201
  - CPSC 202

- CPSC 223
- 3 additional courses in Computer Science, to include 1 intermediate or advanced course (excluding CPSC 490), specific to each track, as indicated
- 6 courses from the arts disciplines, specific to the chosen concentration
- Two-term senior project including CPSC 490, approved by DUS (other senior requirement course is determined by the specific concentration requirement)

**Requirements specific to the Architecture concentration**

- ARCH 150
- ARCH 200
- 2 courses from ARCH 260, ARCH 312, ARCH 360, ARCH 362
- 2 elective courses from either of the two concentrations
- 2 courses from CPSC 376, CPSC 437, CPSC 446, CPSC 451, CPSC 475, CPSC 478, CPSC 479, or CPSC 484
- 1 additional intermediate or advanced Computer Science course (excluding CPSC 490)
- ARCH 491

**Requirements specific to the Art concentration**

- ART 395
- 2 courses in Art at 100 level (excluding prerequisites)
- 2 courses at 200 or 300 level
- 1 at 400 level
- 2 courses selected from CPSC 376, CPSC 437, CPSC 446, CPSC 451, CPSC 475, CPSC 478, CPSC 479, or CPSC 484
- 1 additional intermediate or advanced Computer Science course (excluding CPSC 490)
- ART 496

**Requirements specific to the History of Art concentration**

- HSAR 401
- 1 introductory 100-level course
- 2 courses in different areas of History of Art at 200, 300, or 400 level
- 1 seminar at 400-level in History of Art
- 1 studio art course
- 2 courses selected from CPSC 376, CPSC 437, CPSC 451, CPSC 475, CPSC 478, or CPSC 479, one of which must be CPSC 478 or CPSC 479
- 1 additional intermediate or advanced Computer Science course (excluding CPSC 490)
- HSAR 499

**Requirements specific to the Music concentration**

- CPSC 431
- CPSC 432

- 2 courses from *Group I* (Music Theory)
- 3 courses from *Group I* or *Group II* (Creative Practices)
- 1 course from *Group III* (Western Art Music) or *Group IV* (World and Popular Music)
- 1 additional intermediate or advanced Computer Science course (excluding CPSC 490)
- 1 senior requirement course from MUSI 496-499

### **Requirements specific to the Theater, Dance, and Performance Studies concentration**

- CPSC 431 or CPSC 432
- CPSC 478, CPSC 479, or CPSC 484
- 1 THST course in each of the 4 domains
- 2 additional THST courses in any of the domains
- 1 additional intermediate or advanced Computer Science course (excluding CPSC 490)
- THST 471, THST 491 or THST 492

Computing and the Arts is an interdepartmental major for students who wish to integrate computing with work in architecture, art, history of art, music, or theater studies. Majors explore topics from these arts disciplines in the context of mathematics, computer science, and information technology. For students with a computing perspective, issues in these disciplines present interesting and substantive problems. For students with an artistic perspective, computing methods offer a systematic approach to achieving their vision.

In addition to prerequisites, the major requires six term courses in Computer Science, six in the arts, and a two-term senior project. Students choose a concentration in one of the arts disciplines and satisfy the corresponding requirements. The capstone of the program is a two-term senior project advised by faculty from Computer Science and the chosen art.

During the first year, prospective majors with little or no programming experience should take CPSC 100 or CPSC 112, either of which is a prerequisite for all concentrations. Students with sufficient programming experience may instead enroll in CPSC 201, which is a requirement of the major for all concentrations.

Students considering the music concentration should take the music theory placement test during orientation. Those whose placement requires them to take MUSI 110 should complete this course by the end of the first year.

Prospective majors should also consider the following courses during the first year, depending on their concentration of interest:

- ARCH 260, History of Architecture to 1750
- ARCH 262, Modern Architecture from the Enlightenment to the Millenium
- ART 111, Visual Thinking
- ART 114, Basic Drawing
- HSAR 112, Introduction to the History of Art: Prehistory to the Renaissance

- HSAR 115, Introduction to the History of Art: Renaissance to the Present
- MUSI 210, Counterpoint, Harmony, and Form: 1500–1800
- THST 110, Collaboration
- THST 111, Modes of Performance

Students interested in the major are encouraged to discuss their programs with the director of undergraduate studies (DUS) as early as possible.

View Courses