

# COMPUTER SCIENCE + ANIMATION (BS)

The multidisciplinary Computer Science + Animation (CS+ANI) Bachelor of Science degree program prepares students to span the boundary between computing and its application in animation, providing them with a career path to technical artistic roles in the animation and game development fields. The fact that DePaul boasts both a highly-ranked Animation program in the School of Cinematic Arts and a large, successful Computer Science program in the School of Computing enables us to provide a unique high-quality curricular combination of both educational areas. The CS+ANI curriculum combines a solid computer science core customized to fit the specific needs of this discipline, with a foundation in 3D animation designed by animation and game art faculty. There is a heavier emphasis on programming than on art due to the technical demands of this field. CS+ANI students receive valuable interdisciplinary collaborative group project experiences with teams of students majoring in 3D animation, storyboarding and character design, game design, game art, and game programming.

The CS+ANI BS contains two concentrations, Animation Technical Director and Game Art Technical Director, with requirements of each tailored to the specific requirements of the film and TV and game production fields. A technical director (referred to as a TD in the industry) serves as a bridge between artists and programmers. TDs in both fields can be involved in a wide range of duties, including managing and developing the production pipeline, developing features and add-ons to software, developing custom tools, and working with programmers on larger software projects. They also work on productions doing rigging, modeling, lighting and rendering scenes, building shaders, programming FX and particle systems, and working with motion capture.

Due to the rare combination of technical and artistic skills, the demand is high for people who fit this job description at top animation and game studios.

Program Requirements	Quarter Hours
Liberal Studies	76
Common Major	84
Concentration	20
Open Electives	12
<b>Total hours required</b>	<b>192</b>

## Learning Outcomes

- Model a computational problem, select appropriate algorithms and data structures for a solution, justify the correctness of the algorithm, and implement an application solving the problem.
- Analyze and select an algorithm based on system effects.
- Analyze the efficiency of a computational solution mathematically, and validate the analysis experimentally.
- Criticize a program on the basis of its maintainability and suggest improvements.
- Apply graphics and rendering techniques to support game or animation production.
- Apply essential concepts and utilize tools necessary for 3D entertainment production including modeling, lighting, texturing, rigging, and rendering.

- Utilize scripting knowledge to create tools in professional software packages such as Maya, Unity, Unreal, Houdini, or Nuke.
- Analyze and troubleshoot the artwork-to-render/engine pipeline on a 3D animation or game development project.

## Liberal Studies Requirements

Honors program requirements can be found in the individual Colleges & Schools section of the University Catalog. Select the appropriate college or school, followed by Undergraduate Academics and scroll down.

First Year Program	Hours
<b>Chicago Quarter</b>	
LSP 110 DISCOVER CHICAGO or LSP 111 or EXPLORE CHICAGO	4
<b>Focal Point</b>	
LSP 112 FOCAL POINT SEMINAR	4
<b>Writing</b>	
WRD 103 COMPOSITION AND RHETORIC I <sup>1</sup>	4
WRD 104 COMPOSITION AND RHETORIC II <sup>1</sup>	4
<b>Quantitative Reasoning</b>	
Not Required	
<b>Sophomore Year</b>	
Race, Power, and Resistance	
LSP 200 SEMINAR ON RACE, POWER, AND RESISTANCE	4
<b>Junior Year</b>	
<b>Experiential Learning</b>	
Required	4
<b>Senior Year</b>	
<b>Capstone</b>	
Required in major <sup>1</sup>	

<sup>1</sup> Students must earn a C- or better in this course.

## Learning Domains

**Arts and Literature (AL)** (<https://catalog.depaul.edu/undergraduate-core/liberal-studies-program/liberal-studies-learning-domains/arts-and-literature/>)

- 3 Courses Required
  - ANI 101
  - 1 course selected from: ANI 206 or MCS 207 or MCS 208 or MCS 209 or any HAA course approved for AL
  - 1 additional AL course

**Historical Inquiry (HI)** (<https://catalog.depaul.edu/undergraduate-core/liberal-studies-program/liberal-studies-learning-domains/historical-inquiry/>)

- 2 Course Required

**Math and Computing (MC)** (<https://catalog.depaul.edu/undergraduate-core/liberal-studies-program/liberal-studies-learning-domains/math-and-computing/>)

- Not Required

### Philosophical Inquiry (PI) (<https://catalog.depaul.edu/undergraduate-core/liberal-studies-program/liberal-studies-learning-domains/philosophical-inquiry/>)

- 2 Courses Required
  - 1 course selected from either FILM 228 or CSC 208
  - 1 additional PI course

### Religious Dimensions (RD) (<https://catalog.depaul.edu/undergraduate-core/liberal-studies-program/liberal-studies-learning-domains/religious-dimensions/>)

- 2 Courses Required

### Scientific Inquiry (SI) (<https://catalog.depaul.edu/undergraduate-core/liberal-studies-program/liberal-studies-learning-domains/scientific-inquiry/>)

- 1 Course Required  
[1 Lab Course]

### Social, Cultural, and Behavioral Inquiry (SCBI) (<https://catalog.depaul.edu/undergraduate-core/liberal-studies-program/liberal-studies-learning-domains/social-cultural-and-behavioral-inquiry/>)

- 3 Courses Required

## Major Requirements

Course	Title	Quarter Hours
MAT 140	DISCRETE MATHEMATICS I	4
MAT 141	DISCRETE MATHEMATICS II	4
CSC 241	INTRODUCTION TO COMPUTER SCIENCE I	4
CSC 242	INTRODUCTION TO COMPUTER SCIENCE II	4
CSC 300	DATA STRUCTURES I	4
CSC 301	DATA STRUCTURES II	4
CSC 321	DESIGN AND ANALYSIS OF ALGORITHMS	4
CSC 361	OPTIMIZED C++	4
CSC 373	COMPUTER SYSTEMS I	4
CSC 374	COMPUTER SYSTEMS II	4
GAM 325	APPLIED 3D GEOMETRY	4
GAM 370	RENDERING AND GRAPHICS PROGRAMMING	4
ANI 105	MOTION GRAPHICS FOUNDATIONS	4
ANI 230	3D DESIGN & MODELING	4
ANI 231	3D ANIMATION	4
ANI 332	3D RIGGING	4
ANI 339	3D TEXTURING AND LIGHTING	4
Eight (8) credit hours selected from any courses in ANI, CP, DOC, FILM, GAM, POST, SCWR, or VFX		8
<b>Senior Capstone (Choose one of the following pairs)</b>		<b>8</b>
GAM 394	GAME DEVELOPMENT PROJECT I	
GAM 395	GAME DEVELOPMENT PROJECT II	
OR		
ANI 394	ANIMATION PROJECT I	
ANI 395	ANIMATION PROJECT II	
OR		
CSC 394	SOFTWARE PROJECTS	
Any 300-level ANI, CSC, or GAM course		

Note: Students may take CSC 243 (<https://catalog.depaul.edu/search/?P=CSC%20243>) and one (1) CSC elective in lieu of CSC 241 (<https://catalog.depaul.edu/search/?P=CSC%20241>) and CSC 242 (<https://catalog.depaul.edu/search/?P=CSC%20242>).

## Open Electives

Open elective credit also is required to meet the minimum graduation requirement of 192 hours.

## Program Combination Restrictions

Students pursuing the BS in Computer Science + Animation are forbidden from pursuing a Minor in the following areas: Animation; Animation Technical Director; Computer Science; Game Technical Director; Information Technology.

Concentrations, tracks and specializations provide focus to the degree. In addition to any degree requirements, students are required to choose one of the following:

- Animation Technical Director, Computer Science + Animation (BS) (<https://catalog.depaul.edu/programs/computer-science-and-animation-bs/animation-technical-director-concentration-computer-science-and-animation-bs/>)
- Game Art Technical Director, Computer Science + Animation (BS) (<https://catalog.depaul.edu/programs/computer-science-and-animation-bs/game-art-technical-director-concentration-computer-science-and-animation-bs/>)