Digital Production Arts (DPA)
Program Handbook
2015-2016

Introduction/History

The Master of Fine Arts in Digital Production Arts (DPA) Program is aimed at producing graduates who intend to seek employment in the technology-based, electronic arts industry, in particular, in visual effects production for the film, electronic games, and commercial video industries. As a terminal degree in Fine Arts, the DPA Program also qualifies graduates for careers on university faculties, and as practicing independent artists.

At its meeting on November 5, 1998, the South Carolina Commission on Higher Education approved the Clemson University proposal for the Master of Fine Arts in Computing degree. The Program was begun, on a resource-limited basis, in the Fall of 1999. Increased resources allowed an expanded operation to begin in the Fall of 2000, and full operation began in fall of 2001. In 2002, the title of the program was changed to the current Master of Fine Arts in Digital Production Arts. This document is intended to serve as a guide to those students and faculty at Clemson University who are participating in the Program.

Program Administration

The DPA Program has its administrative home in the Division of Visual Computing, within Clemson’s School of Computing, with facilities in McAdams and Barre Halls. With its ground breaking in January 2015, DPA MFA program will be expanding to North Charleston, SC, to be housed in the Zucker Family Graduate Education Center. The facility, currently under construction near Clemson University’s Restoration Institute campus in the south end of the former Naval Base, is scheduled to be completed in the Spring of 2016, and to begin offering DPA MFA program in the Fall of 2016.

Although the program’s home is in Computing, it is truly inter-disciplinary in design. The program is administered by the DPA Board, which is composed of six Clemson University faculty members. One is the director of the DPA program, two must be from the Department of Art, two must be from the School of Computing, and one must be from the Department of Performing Arts. Board members are elected to these positions by their department or school. Terms are two years and renewable. The Director is chair of the Board. At present, the Board members include: Victor Zordan (Director), Donald House, Timothy Davis, Jerry Tessendorf (School of Computing), David Donar, Greg Shelnutt (Art), and Tony Penna (Performing Arts).
The Director is responsible for long-term planning and the daily operation of the DPA Program and serves on the program’s faculty. The Director is evaluated by the DPA Board, which makes recommendations to the Chair of Visual Computing. As specified in the approved CHE proposal, the DPA Board may, by majority vote, change any components of the Program at any time. Changes to the curriculum requirements follow standard University procedure; in particular, enrolled students have the option of completing any new requirements or the requirements in place at the time of their enrollment.

The key administrative staff position within DPA program is the Administrative Coordinator. The Coordinator works with the Director to operate the DPA Program consistent with University procedures and practices, and to provide for the smooth running of the Program. The Coordinator also has a major outreach responsibility, providing a key point of interface to prospective students, alumni, other universities, and companies that the program has relations with.

Curriculum

The degree requires 60 credit hours. The program is officially listed as a 2-year program, but most students will find that a 2-1/2 or 3 year pace is more realistic and results in a stronger grounding in the field. Of the 60 credit hours, 12 are devoted to Digital Production Studio (DPA 8600), wherein the student participates in group production work; 6 are devoted to Graduate Research Studio (DPA 8800), where students may choose to continue work on a team project, or pursue an individual project or production; and 6 are devoted to the Master of Fine Arts Thesis (DPA 8910). Of the remaining 36 hours, 15 must come from specified Core Courses, and the remainder from approved Electives or Foundation Courses.

By University policy, full time status is defined as being enrolled in 9 credit hours in fall and spring and 3 credit hours in each summer session.

Foundations Courses (0, 3 or 6 credits, as directed on admission)

The Foundation Courses are intended for those entering students who, due to insufficient background, are not prepared to begin graduate level work in either Art or Computing. Up to two foundations classes may be required as directed by the admissions committee upon examination of the student’s portfolio and record of coursework. Students requiring more than two foundations courses will be asked to make up any extra deficiencies before beginning study.

- DPA 6000 Technical Foundations I (F)
- DPA 6010 Technical Foundations II (S)

These courses include introductions to the algorithmic and mathematical bases of computer graphics. They provide students with practical experience in C++ programming, scripting, Linux/Unix operating systems, spatial data structures, mathematics for graphics, and an interactive graphics API. Students will complete a series of visually grounded
programming projects.

DPA 6020 Visual Foundations I (F)
DPA 6030 Visual Foundations II (S)

These courses include introductions to observational drawing and clay modeling, color, principles of composition and design, photography, and storyboarding. Courses incorporate the studio method, involving students in hands-on work and the critique process, and stress examples from the history of art.

Core Courses (15 credits)

The core courses provide the broad underlying artistic, technical, and studio-methods foundations for advanced study, leading to original studio and research work. If a student has taken a course of comparable content at Clemson University or elsewhere, an Elective Course (listed below) may be substituted (decisions on comparable content will be made by the DPA Director).

All students must complete five of the following core courses. Although only five courses are required, students are highly encouraged to take all six. The sixth course may be chosen towards the Electives requirement:

Artistic Core
THEA 6870 Stage Lighting I (F, S)
ART 8210 Visual Narrative (F)

Technical Core
CPSC 6040 Computer Graphics Images (F)
CPSC 8090 Rendering and Shading (S)

Studio Methods Core
CPSC 8070 3D Modeling and Animation (F)
CPSC 8150 Special Effects Compositing (F)

Aesthetics and Theory Electives (3 credits)

All students must complete one of the following aesthetics or theory courses. The aesthetics and theory elective provides an introduction to the analysis and conceptual foundation of visual presentation. Although only one course is required, an additional course from this list may be chosen towards the Electives requirement.

AAH 6300 Twentieth Century Art I
AAH 6320 Twentieth Century Art II
ENGL 6500 Film Genres
ENGL 6510 Film Theory and Criticism
ENGL 8530 Visual Communication
Electives (12-18 credits)

The Electives provide an opportunity for students to either develop a special expertise, or broaden their background to support studio and thesis work. Approved electives are offered in the areas listed below. An additional Core Course or an additional Aesthetics and Theory Elective may be used towards this requirement. The student’s thesis committee, subject to review by the DPA Director, may approve other courses. All students must complete at least four Electives.

Artistic Electives
- ART 6050 Advanced Drawing
- ART 6070 Advanced Painting
- ART 6090 Advanced Sculpture
- ART 6110 Advanced Printmaking
- ART 6130 Advanced Photography
- ART 6170 Advanced Ceramic Arts
- THEA 6720 Improvisation
- THEA 6970 Scene Painting
- AUD 6800 Audio Engineering II

Technical Electives
- CPSC 6050 Computer Graphics
- CPSC 6110 Virtual Reality
- CPSC 6140 Human and Computer Interaction
- CPSC 6160 2D Game Engine Design
- CPSC 6780 General Purpose Computation on Graphical Processing Units
- CPSC 8050 Advanced Computer Graphics
- CPSC 8170 Physically Based Animation
- CPSC 8630 Multimedia Systems and Applications

Studio Methods Electives
- CPSC 8080 Advanced Animation
- CPSC 8190 Physically Based Visual Effects

General Electives
- ECE 8470 Digital Image Processing
- GC 8010 Process Control in Color Reproduction
- PSY 8220 Human Perception and Performance

Digital Production Studio (DPA 8600) (12 credits)

Digital Production Studio provides the student with the opportunity to develop as accomplished visual problem solvers in a team setting. As part of the studio experience, students must complete 12 credits on a team-oriented production project, in which they will work on a project from concept through finished piece. This process provides an experience of working on a goal-oriented artistic team.
Each 8600 will be 6 credits long, comprising a substantial team-based production project. The type of production is driven by the specific choice of the faculty instructor of each offering, e.g. animated-short, or video game. Further, while the 8600 studio experience is typically covered in the second year, students in good standing may take 8600 in their first year, with consent of instructor.

The Digital Production Studio includes regular class meetings, under faculty supervision, providing the vehicle for planning, critique, and presentation of ongoing project work. Although a large majority of studio work is undertaken outside of class meetings, active participation in class is crucial to a successful studio experience, and is required.

**Graduate Research Studio (DPA 8800) (6 credits)**

Graduate Research Studio provides students with the opportunity to complete a major project or projects, under the supervision of a faculty advisor, in a direction supporting the student’s personal goals and aspirations. Such work may be team-oriented or individually-oriented, and may be of a technical or of an artistic nature. Many students will use this course as an opportunity to do an initial exploration of ideas that lead to their Thesis project. All students must complete 6 credits of research studio.

Up to 6 hours of credit for DPA 8600 or DPA 8800 may be obtained for a summer internship experience at a professional production studio approved by the DPA Director.

**M.F.A. Thesis (DPA 8910) (6 credits)**

M.F.A. Thesis consists of a studio project, undertaken with the guidance of the student’s advisor and thesis committee. The thesis project is developed to a refined degree, articulated in the form of a written document, and presented orally in a thesis defense. The project is intended to elaborate and refine a theme that the student has begun to explore in the elective coursework and the production and research studios.

**Sample Course Sequences**

Each student brings a different collection of strengths and weaknesses to the Program, and an appropriate course sequence must be tailored to both the individual’s needs and course availability. Nevertheless, we can illustrate some sequences that would be typical for differing backgrounds.

**Art-Oriented Background Needing Technical Foundations**

*Semester 1*

- DPA 6000 3 Technical Foundations I
- THEA 6970 3 Scene Painting
• CPSC 8070 3 3D Modeling and Animation
• ART 8210 3 Visual Narrative

**Semester 2**
• DPA 6010 3 Technical Foundations II
• ENGL 6500 3 Film Genres
• THEA 6870 3 Stage Lighting
• DPA 8080 3 Advanced Animation

**Semester 3**
• CPSC 6040 3 Computer Graphics Images
• DPA 8600 6 Digital Production Studio

**Semester 4**
• CPSC 8150 3 Special Effects Compositing
• DPA 8600 6 Digital Production Studio

**Semester 5**
• THEA 6720 3 Improvisation
• DPA 8800 6 Graduate Research Studio

**Semester 6**
• ART 6130 3 Advanced Photography
• DPA 8910 6 MFA Thesis

**Computer Science Oriented Background Needing Visual Foundations**

**Semester 1**
• DPA 6020 3 Art Foundations I
• CPSC 6040 3 Computer Graphics Images
• CPSC 6160 3 2D Game Design
• CPSC 8070 3 3D Modeling and Animation

**Semester 2**
• DPA 6030 3 Art Foundations II
• ENGL 6510 3 Film Theory and Criticism
• CPSC 6050 3 Computer Graphics
• CPSC 8080 3 Advanced Animation

**Semester 3**
• ART 8210 3 Visual Narrative
• DPA 8600 6 Digital Production Studio
Semester 4
- CPSC 8150 3 Special Effects Compositing
- DPA 8600 6 Digital Production Studio

Semester 5
- CPSC 8170 3 Physically Based Animation
- DPA 8800 6 Graduate Research Studio

Semester 6
- CPSC 8190 3 Physically Based Visual Effects
- DPA 8910 6 MFA Thesis

Balanced Background Needing No Foundations

Semester 1
- CPSC 6040 3 Computer Graphics Images
- CPSC 6160 3 2D Game Engine Design
- CPSC 8070 3 3D Modeling and Animation
- ART 8210 3 Visual Narrative

Semester 2
- ENGL 6510 3 Film Theory and Criticism
- CPSC 6050 3 Computer Graphics
- CPSC 8080 3 Advanced Animation
- CPSC 8090 3 Rendering and Shading

Semester 3
- CPSC 8150 3 Special Effects Compositing
- DPA 8600 6 Digital Production Studio

Semester 4
- CPSC 8050 3 Advanced Computer Graphics
- DPA 8600 6 Digital Production Studio

Semester 5
- CPSC 8170 3 Physically Based Animation
- DPA 8800 6 Graduate Research Studio

Semester 6
- CPSC 8190 3 Physically Based Visual Effects
- DPA 8910 6 MFA Thesis

Program Equipment
In the visual effects industry, Maya continues to be the standard animation package, and studios that develop their own animation software use Maya as a foundation. More recently, Houdini has established itself as a key tool for visual effects work, Nuke for compositing and post production, and Mari for 3D painting. Accordingly, the Program is currently committed to these platforms as an instructional basis. In addition, the Program is developing an in-house linux-based production pipeline system that provides the glue for all of the commercial software and greatly enhances our ability to produce high-quality production projects. The program has an extensive set of other software that changes periodically as new technology emerges.

The DPA program’s Clemson, SC facility is designed to closely parallel facilities at major animation and effects studios. Located in the main School of Computing building, McAdams Hall, we have a large multi-purpose studio, a classroom, a screening room, and an auxiliary student workroom. In nearby Barre Hall, we have an additional studio. The multi-purpose studio holds 21 high powered dual-screen workstations, a 14 camera Vicon motion capture system, and a green screen area for live action shots. The classroom has seats and computers for 20 students, allowing interactive lectures and hands-on instruction. The screening room houses a cinema grade Christie projector and computers, allowing review of work and screening films at the resolution, brightness, and contrast experienced in a commercial or professional theater. The screening room also has a workstation that is used for presentations, technical demos, and remote reviews with companies for collaboration. The student workroom houses additional work stations for DPA student use. A collection of iMacs with Cintiq tablets allow students to sketch out their latest story ideas or paint surfaces for a character in production. A new MacPro workstation gives students access to high resolution video editing tools. In addition to the workstations, the workroom provides storage lockers for personal belongings, a refrigerator and microwave, and a break area where students can play video games. The Barre Hall studio is used for teaching foundation art classes, providing space for teaching traditional visual foundations of the discipline.

DPA also has access to the School of Computing graphics facilities, which include numerous Linux workstations and virtual reality equipment, all of which reside in a modern facility with gigabit networking throughout. The University provides access to the Palmetto Cluster, a linux cluster of over 21,000 cores and 440 NVIDIA Tesla GPUs that ranks in the top 5 fastest academic supercomputers. Our Visual Effects and Production Studio courses make heavy use of Palmetto for rendering and simulation work.

**Assistantships**

The Program has some assistantship money, which is granted on a competitive basis upon application, and is renewable for a maximum of two years, depending upon availability of funds and student progress. Assistants should report to the Administrative Coordinator to receive assigned duties. Other assistantships are typically available in many departments across the university; nearly all of our students who desire an assistantship are usually able to find one, as DPA students are highly sought. Additionally, students may refer
to the Student Affairs Department website for available positions on campus. Students may also benefit from applying to university-wide student scholarships and awards.

**Internships**

Summer internships at production studios are highly desirable, and it is a goal of the Program to assist all qualified students in securing such positions. Internships are competitive and successful applicants usually have two important components: a strong demo reel and a strong recommendation from someone whom the studio knows and trusts. Building a strong demo reel in the first year is a difficult challenge. Those students interested in internships should select an advisor who can assist with this task as early as possible, preferably no later than the end of the first semester. Strong recommendations are not given lightly, in that they reflect on the strength of the program and affect future relationships with the studio in question. The studios want to see two pairs of antithetical characteristics in every applicant: an artist and a scientist. In addition, they want a creative, original thinker and a cooperative team player. Accordingly, all four factors are weighted equally in making recommendations. The bottom line for assistantships: both attitude and work quality count.

**Student Forms**

The following GS student forms are available on the Clemson University Graduate School website: http://www.clemson.edu/graduate/students/forms.html

- **GS2 (Plan of Study and Graduate Degree Curriculum) - iRoar**
  All students must complete and submit the Graduate Degree Curriculum form GS2 by the middle of their second semester. The final version of the student’s GS2 must be on file by the date specified by Enrolled Services (graduation deadlines can be found on the deadlines page at www.clemson.edu/graduate/students/deadlines.html), or a late fee of $25 for the first day and $5 for every additional day will be charged. This form lists both the student’s planned curriculum and the student’s Advisory Committee. The Advisory Committee is selected by the student with consent of the faculty selected. The Committee must include three Clemson University graduate faculty members, at least two of whom are DPA Board members. Any Board member may serve as the Committee Chairperson. The Chairperson is the student's principal advisor. The DPA Director signs as Program Coordinator, the School of Computing Director as Department Head and the Dean of the College of Engineering and Science as College Dean. The Advisory Committee will read the Master's Thesis, hear the Thesis defense, and decide, by majority vote, on a pass/fail for the Thesis. As of Spring 2015 semester, the GS2 form is completed and submitted by the student electronically through their iRoar account.

- **GS4 (Application for Graduation and Diploma Order) - iRoar**
  As of Spring 2014, this form is no longer used. To apply for graduation, students must do so electronically through their iRoar account. Choose “Apply for Graduation” under the “Student Record” menu. If you have questions or problems about ap-
plying for graduation, please call Enrolled Services at 864-656-5339 or email weartha@clemson.edu

- **GS7M** (Final Exam and Thesis Approval Form)
  Your advisor should bring this form to your thesis oral presentation/defense.

- **GS2000** (Graduate Assistant Tuition Remission Form)
  This form is required for each appointment period and assistantship title change and must be completed by department personnel and the graduate assistant.

**Thesis Timeline**

Below is an outline of when different forms and decisions related to the thesis should be made. Students may always submit forms or make the decisions listed below earlier than noted.

- Spring semester, year 1: Select thesis/academic advisor
- Fall semester, year 2: Select thesis committee
- Fall semester, year 2: Submit GS2 form
- Semester of graduation (check these dates against the academic schedule available on the graduate school webpages):
  - Submit GS4 (must be completed by second week)
  - Order cap and gown (must be completed by third week)
  - Schedule thesis presentation/defense date with committee
  - Complete and distribute final draft of thesis to thesis committee (two weeks prior to defense date)
  - Conduct oral thesis presentation/defense (at least two weeks prior to graduation date)