SELF STUDY

PROGRAM REVIEW

DSU
DAKOTA STATE

BACHELORS OF SCIENCE

IN

COMPUTER GAME DESIGN

COLLEGE OF COMPUTING

&

COLLEGE OF ARTS AND SCIENCES

FALL 2016

DAKOTA STATE UNIVERSITY

ONSITE VISIT DATE: 12/09/16

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PART 1: INSTITUTIONAL HISTORY

Brief History of Dakota State University

Dakota State University has enjoyed a long and proud history of leadership and service since its founding in 1881 as the first teacher education institution in the Dakota Territory.

For most of its history, DSU has been identified with teacher preparation, first as a normal school and later as a four-year public college. The University has had several different names, among them Madison Normal, Eastern Normal, and General Beadle State College. The name, Dakota State College, was adopted in 1969. On July 1, 1989, Dakota State College became Dakota State University. The University title was conferred on the institution by the South Dakota Legislature in order to better reflect its purpose in the total scheme of the state's higher education system. Prospective elementary and secondary teachers continue to be educated here. To this traditional emphasis, DSU added business and traditional arts and science programs in the 1960s and two health services programs, Health Information Management and Respiratory Care, in the late 1970s.

In 1984, the South Dakota Legislature and the South Dakota Board of Regents turned to Dakota State University to educate leaders for the information age. In response, Dakota State University developed leading-edge computer/information systems degree programs. The graduates of these programs enjoy enviable status in the national marketplace. As a leader in computer and information systems programs, DSU has pioneered the application of computer technology to traditional fields of academic endeavor. This thrust has led to the development of unique degree programs in biology, English, mathematics, and physical science.

Dakota State University continues to serve the needs of a changing society in its second century. In order to provide its academic programs to a broader audience, DSU has promoted the use of distance education to deliver academic courses and programs.

Dakota State has been recognized nationally for innovative curriculum. In Spring 2004, DSU was one of ten colleges in the country named a National Center of Academic Excellence in Information Assurance Education by the National Security Agency.

DSU was ranked first in the Top Public Comprehensive Colleges - Bachelor's Division in the Midwest region by U.S. News and World Report magazine in 2007, 2008, 2009, 2010 and 2011. When DSU added two Doctor of Science programs they were move to a new classification.

College Mission – College of Computing

During the 2014-2015 academic year, a College of Business and Information Systems (BIS) taskforce was convened to recommend possible modifications to the college mission. The result was the splitting off of the computer science related programs into a new college. The new College of Computing (CoC) came into existence at the start of the 2015-2016 academic year.

The mission of the College of Computing is to educate and prepare students to be lifelong learners and professionals in computer science, cyber operations, network & security administration, and computer game design. Inherent in the educational process is challenging individuals to develop information management skills, to think logically, and to make sound decisions. Information technology is integrated throughout the curriculum.

The following programs are offered in the College of Computing; at the undergraduate level: Computer Science, Cyber Operations, Network & Security Administration, Computer Game Design (a joint program with the College of Arts and Sciences); at the graduate level: Masters of Science in Applied Computer Science (MSACS), Masters of Science in Information Assurance and Computer Security (MSIA), Doctor of Science in Cyber Security.

College Mission – College of Arts & Sciences

History of the Computer Game Design Program

Dakota State University developed a Bachelor of Science in Computer Game Design in 2008 as a continuation of the 1984 mission change. The program was an explicitly interdisciplinary program, jointly housed in both the College of Computing (then part of the college of Business and Information Systems) and the College of Arts and Sciences.

- The CGD Program is a program in Computer Game Design and **Development** – which emphasizes the aspects of integrated or systemic design essential to the making of computer games. In some senses, it might best be thought of a game engineering program analogous to systems engineering.
- The curriculum was inspired by the IGDA curriculum recommendations, but also included another goal: to be a rigorous program which guarantees the development of employable skills among the students.
- The program has leveraged existing course resources in both computing and design when possible. As a result, the curriculum has three "cores" – one in design, drawing mostly on ARTD courses; one in computing, drawing mostly on Computer Science courses; and finally a core specific to game design and development and the application of the skills learned in the other cores to the creation of games.
- There has consistently been an essential focus on systemic, integrated design of games, which includes all aspects of game development and a recognition that design tradeoffs are pervasive and often usefully applied across diverse disciplines.
- Within the game specific core there has been an emphasis on soft skills essential to game development: teamwork, communication, and problem solving. These soft skills have proven to be attractive to potential employers.
- Computer Game Design has been seen and treated as a potentially valuable recruiting tool by DSU. In assessment studies, it was found that 9% of CGD students transfer to other disciplines but remain at DSU.
- The program grew rapidly from nothing to 100+ students and has stabilized at that level.

Prior Institutional Review of the Computer Game Design Program

This is the first institutional review for the Computer Game Design program. The game design faculty have made a practice of discussing the curriculum frequently with both industry representatives and other academics in Computer Game Design and Development, as well as performing internal reviews of course and student outcomes. These reviews have resulted in tweaks to the curriculum, including increasing prerequisites for various core courses. Two broader curriculum changes included creating formal emphasis areas in software, design, and narrative, as well as facilitating a double major with Computer Science.

Additional curriculum planned changes based on previous informal and internal reviews include modifications to the curriculum (currently in the approval process) by adding:

- GAME 101 an essential games course (1 credit) – replacing GS100 course
- GAME 220 Game programming tools(3 credit)
- GAME 261 Worldbuilding

Beyond the curricular developments, the CGD program has played a significant role in three major annual events at DSU: Nanocon (with the workshop on Integrated Design in Games), the Global Game Jam, and the All Fools' Day Game Faire.

PART 2: TRENDS IN THE DISCIPLINE

The major trends would be continued growth from estimates of (U.S.) industry size of $10billion in 2010 to $16billion in 2014, and $23.5billion in 2015. World wide, the industry is significantly larger and expanding even faster than the US market.

Platforms for game delivery have seen a significant change from platforms and PCs to mobile platforms, especially mobile phones. Unity has become a dominant tool for game creation and distribution.

The mix of large company "blockbusters" to smaller, independent titles has shifted markedly toward the smaller, indie titles. Both cost and risk of large games is high, so large studios have more and more embraced a trend of conservative development efforts to minimize risk, while smaller studios have been providing more innovative games.

Another trend has been toward increasing roles for both virtual and augmented reality, with Pokemon Go the most obvious example of that trend.

Curriculum implications

The evolution toward smaller, more innovative studios is one that fits well with our current curriculum. The one thing that will be useful will be incorporating mobile development coursework from other disciplines, so that it can be applied to game design.

Program Limitations

Currently the major limitation of the computer game design program at DSU is the ability to grow the computer game design faculty and related faculty (particularly in the field of Computer Science). Improved development laboratory space is planned as part of the Beacom building currently under construction. Additional (committed) financial resources would be needed to grow the program. While the university has generously supported the program on an ad-hoc basis, computer game design would benefit from dedicated funds to provide support for program events and activities (e.g., IDiG workshop speakers, hosting GGJ, students attending GDC). Since game development is not a significant local industry, events and activities typically run into greater expense due to travel either by DSU representatives to remote locations or by guests traveling to DSU.

PART 3: ACADEMIC PROGRAM AND CURRICULUM

Program description and requirements

The computer game design program offers a Bachelor's of Science in Computer Game Design with three possible optional Emphases available. Students obtaining a degree in Computer Game Design only need to complete the Mathematics Component of the Math program to obtain a second major in Mathematics for Information Systems. Computer Game Design students who complete an emphasis in software development require minimal additional credits to complete a double major in Computer Science.

2015-2016 Program Requirements

http://catalog.dsu.edu/preview_program.php?catoid=18&poid=1225

System-wide General Education Requirement (30 Credits)

Majors must take ART 121, MATH 123, PHYS 111/PHYS 113 or PHYS 211/PHYS 213 as part of the System-wide General Education Requirement.

Institutional Graduation Requirement (11 Credits)

Majors must take CSC 150 as part of the Institutional Graduation Requirement.

Required Courses (60 Credits)

- ARTD 282 - 2-D Design on Computers I 3 credits
- ARTD 285 - 2-D Design on Computers II 3 credits
- ARTD 382 - 3-D Design on Computers I 3 credits
- ARTD 385 - 3-D Design on Computers II 3 credits
- ARTD 431 - Computer Graphic Effects I 3 credits
- CIS 275 - Web Application Programming I 3 credits
- CIS 332 - Structured Systems Analysis and Design 3 credits
- CIS 375 - Web Application Programming II 3 credits

- CSC 250 - Computer Science II 3 credits
- CSC 260 - Object Oriented Design 3 credits
- CSC 300 - Data Structures 3 credits
- DAD 375 - Storyboarding 3 credits
- GAME 111 - Introduction to Game Design 3 credits
- GAME 222 - Computer Game Analysis and Development 3 credits
- GAME 333 - Project and Process I 3 credits
- GAME 334 - Project and Process II 3 credits
- GAME 444 - Project Development I 3 credits
- GAME 445 - Project Development II 3 credits
- MATH 282 - Mathematics of Games 3 credits
- MCOM 353 - Web-Based Interactivity 3 credits

Electives (19 Credits)

Students may complete their degree by earning the 19 elective credits from any area. Students might pursue additional courses in art or programming or interests as varied as history or economics.

Emphasis

Students may concentrate on a specific area of game development by taking additional courses. To earn an optional Emphasis, students may (in consultation with their program advisor) select and complete 30 credits from one of the following three areas:

Game Art Emphasis (30 credits)

- ART 111 - Drawing I 3 credits

- ART 122 - Design II Color 3 credits
- ART 123 - Three Dimensional Design 3 credits
- ART 212 - Drawing IV: Mixed Media 3 credits
- ART 213 - Figure Drawing 3 credits
- ART 231 - Painting I 3 credits
- ART 340 - Sculpture Techniques 2-3 credits (3 credits required)
- ARTD 185 - Introduction to Animation 3 credits
- ARTD 245 - History of Graphics 3 credits
- ARTD 250 - 2D Digital Animation 3 credits
- ARTD 286 - Motion Graphics and Compositing 3 credits
- ARTD 336 - Digital Photography I 3 credits
- ARTD 356 - Digital Painting 3 credits
- ARTD 388 - Environmental Design 3 credits
- ARTD 436 - Digital Photography II 3 credits
- ARTD 439 - 3-D Character Design and Modeling 3 credits
- ARTD 441 - 3-D Character Animation 3 credits
- ARTD 460 - Digital Editing 3 credits
- ARTD 480 - Studio Processes 3 credits
- GAME 491 - Independent Study 1-3 credits (3 credits required)
- GAME 492 - Topics 1-3 credits (3 credits required)

Narrative Design Emphasis (30 credits)

- ARTD 185 - Introduction to Animation 3 credits
- CIS 447 - Artificial Intelligence 3 credits
- DAD 310 - Digital Soundtrack Production 3 credits
- GAME 291 - Independent Study 1-3 credits (3 credits required)
- GAME 292 - Topics 1-3 credits (3 credits required)
- GAME 360 - Narrative Design 3 credits

- GAME 363 - Game Genres: 3 credits
- GAME 365 - Classical Myth and Media 3 credits
- GAME 366 - Contemporary Myth and Media 3 credits
- GAME 370 - Game Mechanics: 3 credits
- GAME 375 - Level Design I 3 credits
- GAME 475 - Level Design II 3 credits
- GAME 491 - Independent Study 1-3 credits (3 credits required)
- GAME 492 - Topics 1-3 credits (3 credits required)

Software Development Emphasis (30 credits)

- CIS 447 - Artificial Intelligence 3 credits
- CIS 468 - Scripting for Network Administration 3 credits
- CIS 484 - Database Management Systems 3 credits
- CIS 487 - Database Programming 3 credits
- CSC 403 - Programming Graphical User Interface 3 credits
- CSC 410 - Parallel Computing 3 credits
- CSC 433 - Computer Graphics 3 credits
- CSC 451 - Mobile Development Environments 3 credits
- CSC 456 - Operating Systems 3 credits
- CSC 461 - Programming Languages 3 credits
- CSC 466 - Language Processing 3 credits
- CSC 482 - Algorithms and Optimization 3 credits
- GAME 491 - Independent Study 1-3 credits (3 credits required)
- GAME 492 - Topics 1-3 credits (3 credits required)
- MATH 201 - Introduction to Discrete Mathematics 3 credits
- MATH 315 - Linear Algebra 3-4 credits (3 credits required)
- MATH 316 - Discrete Mathematics 2-3 credits (3 credits required)

Students double majoring in Computer Science and Computer Game Design are required to take other courses as part of the Computer Game Design requirements that address the content of CIS 383 and CSC 470, so these two courses are being waived from the CSC major requirements.

Sample Academic Plans for Computer Game Design

Note: There is currently discussions for the removal of the 11 IGR credits. It is anticipated that if this were to happen, the Computer Game Design program will include CSC 105 and CSC 150 as part of the CGD major directly. The remaining 5 credits would be added to the electives or used for planned additional courses.

Academic Plan Entering for students who test into Calc I

<table>
<tr><td colspan="2" rowspan="3" align="center">**DSU DAKOTA STATE**</td><td colspan="2" rowspan="3" align="center">**MAJOR ACADEMIC PLAN (MAP)**
Computer Game Design
EFFECTIVE CATALOG YEAR 2015-16</td><td colspan="2" rowspan="3" align="center">**DSU DAKOTA STATE**</td></tr>
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Sample Schedule (subject to course rotations)

FALL			SPRING	
First Semester	**CR**	**Second Semester**	**CR**
ENGL 101 Composition I	3	ARTD 285 2-D Design on Computers II	3
MATH 123 Calculus I	4	CSC 250 Programming II	3
CSC 105 Introduction to Computers	3	MATH 282 Math For Games	3
CSC 150 Programming I	3	GAME 111 Intro to Game Design	3
ART 121 2-D Design	3	SGE Social Sciences (e.g., SOC 285 Information Society)	3
GS 100: University Experience or Equivalent	0		15
	16		
			31

Third Semester	**CR**	**Fourth Semester**	**CR**
Physics 211	4	DAD 375 Storyboarding	3
ARTD 282 2-D Design on Computers I	3	Physics 213	4
ARTD 382 3-D Design on Computers I	3	CSC 300 Data Structures	3
CSC 260 Object-Oriented Design	3	ARTD 385 3-D Design on Computers I	3
ENGL 201 Composition II	3	GAME 222 Computer Game Design	1
	16		16
			32

Fifth Semester	**CR**	**Sixth Semester**	**CR**
GAME 333	3	GAME 334	3
SGE Arts & Humanities (e.g., THEA 131 ACTING)	3	SGE Social Science	3
SGE Oral Communication	3	MCOM 353 Web-based Interactivity	3
CSC 275 Web Programming I	3	CSC 375 Web Programming II	3
CIS 332 Structured Analysis & Design	3	Elective	3
	15		15
			30

Seventh Semester	**CR**	**Eighth Semester**	**CR**
GAME 444 Project Development I	3	GAME 445 Project Development II	3
ARTD 431 Computer Graphic Effects I	3	IGR WEL 100/100L Wellness for life and lab	2
IGR – Written Communication	3	Elective	3
Elective	3	Elective	3
Elective	1		
	13		14
			27

Accreditation Standards in the Discipline

There is no accreditation in the field of Computer Game Design. Programs vary widely.

- Involvement with IGDA and HEVGA
- Rigorous program focused on principles rather than facility with tools
- Looked to solid established programs when considering curriculum (CMU, Santa Cruz, MIT, …)

Program delivery

Core GAME courses in the program are delivered only face-to-face on-site in Madison, SD in a traditional classroom. All courses required to earn a major are available through DSU. All courses and requirements which overlap with DSU's Computer Science program are available both on-campus and online through Dakota State University. Some courses from the Design area of the CGD requirements are also available via online courses from DSU.

Strengths of the Program

Since the discipline of Computer Game Design and Development is new and in the process of being defined, there is a great deal of variety among programs. DSU's program is distinguished by its rigor and its systemic approach incorporating skills from design, computer science, writing, and audio into a coherent degree.

- DSU's program is rigorous and broad, incorporating skills from other disciplines into a coherent educational experience that prepares students for work developing interactive, multimedia software systems.
- DSU's program is reasonably priced. Students attracted from across the nation have described the reason as a solid program with a reasonable price tag.
- DSU's program has been successful with job placement (e.g., 91% in 2014).
- DSU's program enjoys the support and benefit of strong related programs such as Computer Science, Production Animation, and the national reputation of Cyber Operations.

- DSU's program has been successful in national competitions (success rate at the GDC narrative competition is as good or better than any other school in the nation).

- DSU's program was successful in having an Assistant Professor promoted and tenured.

- DSU's program has a marked strength in narrative design (in the sense of integrated or systemic design). It has an internationally recognized faculty member, Dr. Jeffrey Howard in this area, along with concerted support from all game design faculty.

- DSU's program is in the process of establishing an advisory board and currently has commitments from: Ken Rolston, Richard Dansky, and Denis Dyack to participate on the board.

- DSU's program does not have the common weaknesses of many game programs: excessive focus on computing or excessive focus on art.

Curriculum management

Curriculum for the program is overseen by the Computer Game Design Faculty, led by Dr. Graham. Under the current structure, curriculum modifications initiated at this level are then reviewed by both the colleges (Computing and Arts & Sciences) and approved by the deans. They are then forwarded to the university curriculum committee and are acted on under the university policies.

PART 4: PROGRAM ENROLLMENTS AND STUDENT PLACEMENT

Admission standards

Each university may adopt specific admission regulations, consistent with law and the requirements set by the Board of Regents, as may be required for each school or program to assure acceptable student preparation and enrollment levels. A copy of such regulations and any subsequent amendments shall be filed with the Executive Director and shall be subject to review by the Board of Regents.

The Computer Game Design program does not have any additional requirements into the program beyond those stated for the university as a whole. The current DSU admissions guidelines now cover a wide range of potential students. Therefore it is recommended that one view the current admission standards at:

http://catalog.dsu.edu/content.php?catoid=18&navoid=972

Program Enrollment Breakdown

Program enrollment had shown a strong trend upward since the program began with zero students in 2008, since then it appears to have stabilized at slightly over 100 students.

Total Enrollment

Program enrollment is based on the number of students enrolled in at least one DSU class with an active program of Computer Game Science (BS) as of fall census. If a student is enrolled in multiple programs, they will be counted in each of the programs.

College enrollment is based on the number of students enrolled in at least one DSU class with an active program in the College of Business and Information Systems as of fall census. If a student in enrolled in programs in multiple colleges, they will be counted in each of the colleges (CSC – BIS & Math – AS). However, if a student has multiple active programs in the same college, they will only be counted once at the college level.

University enrollment is based on the number of students enrolled in at least one DSU class as of fall census. If a student is enrolled in multiple programs, they are only counted once at the university level.

Table 1: Program, College and University Enrollments

	Fall 2005	Fall 2006	Fall 2007	Fall 2008	Fall 2009	Fall 2010	Fall 2011	Fall 2012	Fall 2013	Fall 2014	Fall 2015
Computer Game Design (BS)	0	0	0	5	39	61	88	103	116	110	103

College of Business & Information Systems	787	799	792	850	948	1027	1068	1101	1186	1318	1445
University Enrollment	2329	2439	2570	2780	2861	3101	3102	3110	3129	3047	3145

Table 2: Student Diversity – Gender & Ethnicity for Computer Game Design

Computer Game Design (BS)	**Fall 2012**	**Fall 2013**	**Fall 2014**	**Fall 2015**
Gender				
Female	12	11	11	15
Male	91	105	99	97
Ethnicity				
White	86	96	92	97
Other Races/Unknown	17	20	18	15

A student with an ethnicity of white includes only those students who are non-Hispanic with a race of white only. Immigration status is not considered.

The number of females with computer game design majors remains low compared to males. Since the program is new and resources are limited, no special efforts have yet been made to increase enrollment among women. This represents a clear opportunity.

Degrees Awarded

Table 3: Number of Degrees Awarded by Academic Year

	SU05, FA05 & SP06	SU06, FA06 & SP07	SU07, FA07 & SP08	SU08, FA08 & SP09	SU09, FA09 & SP10	SU10, FA10 & SP11	SU11, FA11 & SP12	SU12, FA12 & SP13	SU13, FA13 & SP14	SU14, FA14 & SP15
Computer Science (BS)	0	0	0	0	0	0	4	13	16	10

An academic year is defined as summer, fall, and spring for the purpose of this report.

As the number of enrolled students increases it is expected that the number of graduates will also increase. Additionally, the Board of Regents has made the increase in the percent of majors obtaining degrees a stated priority.

Persistence

Persistence is defined as the proportion of a student cohort who enrolled for the first time in a given fall semester and then re-enrolled in a subsequent spring semester. The student must be enrolled in at least one DSU class to be considered persisted. For persistence purposes, a specific population is used: first-time, full-time, baccalaureate degree-seeking freshmen. A

student may be counted more than once. If the student is a double major, they will be counted in each major.

Table 4: Persistence Rates for First-time, Full-time, Baccalaureate Degree-seeking Freshmen (Fall 2012 to Fall 2015 Cohorts)

Program	Fall 2012 Cohort		Fall 2013 Cohort		Fall 2014 Cohort		Fall 2015 Cohort	
	N	% Ret. 2nd semester (SP13)	N	% Ret. 2nd semester (SP14)	N	% Ret. 2nd semester (SP15)	N	% Ret. 2nd semester (SP16)
Computer Game Design (BS)	30	87%	36	94%	29	93%	32	94%

N=total number of students

% Ret 2nd semester = the percentage of students from the cohort who registered for at least one DSU class in the subsequent spring.

Table 5: Persistence Rates for Incoming Degree-Seeking Transfers (Fall 2012 to Fall 2015 Cohorts)

Program	Fall 2012 Cohort		Fall 2013 Cohort		Fall 2014 Cohort		Fall 2015 Cohort	
	N	% Ret. 2nd semester (SP13)	N	% Ret. 2nd semester (SP14)	N	% Ret. 2nd semester (SP15)	N	% Ret. 2nd semester (SP16)
Computer Game Design (BS)	7	100%	4	100%	6	83%	4	100%

N=total number of students

% Ret 2nd semester = the percentage of students from the cohort who registered for at least one DSU class in the subsequent spring.

Retention

Retention is defined as the proportion of a student cohort who enrolled for the first time in a given fall semester and then re-enrolled in a subsequent fall semester. The student must be enrolled in at least one DSU class to be considered retained. For retention purposes, a specific population is used: first-time, full-time, baccalaureate degree-seeking freshmen. A student may be counted more than once. If the student is a double major, they will be counted in each major.

Table 6: Retention Rates for First-time, Full-time, Baccalaureate Degree-seeking Freshmen (Fall 2011 to Fall 2014 Cohorts)

	Fall 2011 Cohort		Fall 2012 Cohort		Fall 2013 Cohort		Fall 2014 Cohort	
	N	% Ret. 2nd year (FA12)	N	% Ret. 2nd year (FA13)	N	% Ret. 2nd year (FA14)	N	% Ret. 2nd year (FA15)
Computer Game Design (BS)	25	76.0%	30	56.7%	36	69.4%	29	72.4%

N=total number of students

% Ret 2nd year = the percentage of students from the cohort who registered for at least one DSU class in the subsequent fall.

Table 7: Retention Rates for Incoming Degree-Seeking Transfers (Fall 2011 to Fall 2014 Cohorts)

Program	Fall 2011 Cohort		Fall 2012 Cohort		Fall 2013 Cohort		Fall 2014 Cohort	
	N	% Ret. 2nd year (FA12)	N	% Ret. 2nd year (FA13)	N	% Ret. 2nd year (FA14)	N	% Ret. 2nd year (FA15)
Computer Game Design (BS)	8	75.0%	7	100.0%	4	75.0%	6	83.3%

N=total number of students

% Ret 2nd year = the percentage of students from the cohort who registered for at least one DSU class in the subsequent fall.

Program Graduation

Graduation is defined as the number of the first-time, full-time, baccalaureate degree-seeking freshmen who enrolled at DSU in the fall and received a baccalaureate degree from DSU within five or six years. If a student graduated with an associate degree, they are counted as not graduated.

Table 8: Graduation Rates for First-time, Full-time, Baccalaureate Degree-seeking Freshmen (Fall 2008 to Fall 2009 Cohorts)

	Fall 2008 Cohort					Fall 2009 Cohort				
	Total No. of Students in Cohort	Graduate within 5 years		Graduate within 6 years		Total No. of Students in Cohort	Graduate within 5 years		Graduate within 6 years	
		N	%	N	%		N	%	N	%
Computer Game Design (BS)	3	0	0.0%	1	33.3%	25	6	24.0%	10	40%

N=number of students

% = the percentage of students from the cohort who graduated.

Overall Computer Related Enrollment

DSU graduates the largest number of baccalaureate and master's students in computer related degree programs annually in the BOR system.

Table 9: DSU College of Computing Program Enrollment

	Fall 2012	Fall 2013	Fall 2014	Fall 2015
Undergraduate Fall Enrollment				
B.S. Computer Science	168	182	217	291
B.S. Computer & Network Security	173	144	77	38
B.S. Cyber Operations	0	65	168	217
B.S. Computer Game Design	103	116	110	112
B.S. Network & System Admin.	41	42	24	10
B.S. Network & Security Admin.	0	37	83	128
Graduate Fall Enrollment				
M.S. Info. Assurance & Computer Security	43	36	37	46
M.S. Applied Computer Science	0	4	16	21
M.S. Applied Computer Science – Cyber Operations	0	0	0	2
DSC Cyber Security	0	0	0	14

Source: DSU Fall Enrollment Reports. B.S. in Computer Game Design was approved in 2008;

Table 10: DSU Degrees Conferred in the College of Computing by Academic Year

	2011-2012	2012-2013	2013-2014	2014-2015
Undergraduate Degrees Conferred				
B.S. Computer Science	10	15	21	14
B.S. Computer & Network Security	30	26	26	31
B.S. Cyber Operations	0	0	2	4
B.S. Computer Game Design	0*	4	13	16
B.S. Network & System Admin.	2	12	8	12
B.S Network & Security Admin.	0	0	0	0
Graduate Degrees Conferred				
M.S. Information Assurance & Computer Security	16	20	12	21
M.S. Applied Computer Science	0	0	0	9
M.S. Applied Computer Science – Cyber Operations	0	0	0	0
DSC Cyber Security	0	0	0	0

* B.S. in Computer Game Design was approved in 2008; first graduates from that degree program will occur in 2013.

Academic year is defined as summer, fall and spring.

Table 10: DSU Degrees Conferred in the College of Computing by Academic Year

	2011-2012	2012-2013	2013-2014	2014-2015
Undergraduate Degrees Conferred				
B.S. Computer Science	10	15	21	14
B.S. Computer & Network Security	30	26	26	31
B.S. Cyber Operations	0	0	2	4
B.S. Computer Game Design	0*	4	13	16
B.S. Network & System Admin.	2	12	8	12
B.S Network & Security Admin.	0	0	0	0
Graduate Degrees Conferred				

	2011-2012	2012-2013	2013-2014	2014-2015
M.S. Information Assurance & Computer Security	16	20	12	21
M.S. Applied Computer Science	0	0	0	9
M.S. Applied Computer Science – Cyber Operations	0	0	0	0
DSC Cyber Security	0	0	0	0

* B.S. in Computer Game Design was approved in 2008; first graduates from that degree program will occur in 2013.

Academic year is defined as summer, fall and spring.

The number of degrees conferred has tracked the increasing enrollment in the CGD program

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Program Placement

Placement information for each program can be found at:
http://dsu.edu/assets/uploads/resources/Graduate-Placement-Data-2014.pdf

PART 5: FACULTY CREDENTIALS

The following is a list of principle instructors in the computer science program. (That is, they may teach at least one course that is 200 level and above and is required.) Faculty Vitae are included in **Appendix A**.

Primary Computer Game Design Faculty

Dr. Steven Graham, Associate Professor of Computer Science/Computer Game Design
Ph.D. (Computer Science), University of Kansas

Dr. Jeffrey Howard, Assistant Professor of Computer Game Design and Development
Ph.D. (English), University of Texas - Austin

Dr. Glenn Berman, Associate Professor of Math/Computer Game Design
Ph.D. (Mathematics), University of Louisiana

Related Faculty (Faculty may teach required courses in the design or programming core)
This list is representative rather than exhaustive.

Dr. Tom Halverson, Associate Professor of Computer Science
Ph.D. (Computer Science), The University of Iowa

Dr. Stephen Krebsbach, Associate Professor of Computer Science
Ph.D. (Computer Science), North Dakota State University

Austin O'Brien, Assistant Professor of Computer Science
ABD-(Computational Statistics – Expected Spring/Summer 2016), South Dakota State University

Angela Behrends, Instructor – Digital Arts
MFA – University of Nebraska, Lincoln

Ryan English, Assistant Professor of Animation
MFA – Ohio State University

Zhe Ren, Assistant Professor of Digital Arts and Design
MFA – Southern Illinois University

Dr. Walter Iriarte, Assistant Professor, Arts & Sciences
Ph.D. Clemson University

Thomas Jones, Professor of Digital Arts
MFA – Stephen F. Austin State University

Primary Computer Science Faculty Additional Information

Dr. Steven Graham, Associate Professor of Computer Science/Computer Game Design

Dr. Graham teaches courses which overlap both the Computer Science and the Game Design programs. . For the game design program, he leads the Junior/Senior project courses. For the computer science program, he teaches Software Engineering, Algorithms, Artificial Intelligence, Graphical User Interface Programming, and Graphics Programming. Dr. Graham has been involved in the development of the vSURF, the virtual Sanford Underground Research Facility environment which provides a 3d model of aspects of SURF. Additionally, he works with students on various game development projects. Dr. Graham, in conjunction with Dr. Jeffrey Howard, founded the workshop on Integrated Design in Games (IDiG), meeting for the sixth consecutive year November 8-9, 2016. Dr. Graham works with Dr. Howard as the lead programmer for the Arcana project. He has also been the producer of two serious games: *Clinic Ninja*, and *Stickman Stu and the Cake Crew*.
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Dr. Jeffrey Howard, Associate Professor of Computer Game Design and Development

Ludomancer, Technomage, Occult Game Designer. I am Associate Professor of Game Development and Design at Dakota State University, where I specialize in horror and occult themes and mechanics in games. My current focus is primarily on game magic systems, which I both study and create. I am the author of Game Magic: A Game Designer's Guide to Constructing Magic Systems and Quests: Design, Theory, and History in Games and Narratives, as well as the creator of Howard's Law of Occult Game Design (published in 100 Principles of Game Design). My own theory and practice converge in my work as lead designer of Arcana: A Ceremonial Magick Simulator and Ritual Toolset.

Dr. Glenn Berman, Associate Professor of Mathematics

Primarily a mathematics professor, Dr. Berman is an authority on non-digital games, with especial expertise in role-playing games. He has organized the Nanocon Game Convention, now in its 14th year with attendance between 400-500 for the last few years. Dr. Berman contributes to various GAME core courses, and, is responsible as the lead developer and teacher for our Introduction to Game Design course.

Anticipated Changes in the Program

It is anticipated that the Computer Game Design program may continue to grow through increased enrollment of CGD majors. Enrollment for CGD draws from a significantly wider area than most majors at DSU. There are two essential requirements for further growth: new faculty in Computer Game Design and Development and national exposure through professional travel, marketing, etc. Another avenue for growth would be by reaching more young women in the region and increasing the enrollment of women in the CGD program. Participating in or holding workshops, such as the CyberCamps held so successfully by the Network Security department at DSU, would be an obvious step, but again, additional faculty resources are needed.

PART 6: ACADEMIC AND FINANCIAL SUPPORT

Resources providing academic support to faculty and students in computer game design include the Karl E. Mundt Library, a wireless computer infrastructure, classrooms equipped with computer projection systems, and a dedicated computer game development laboratory for upper level game development projects.

Undergraduate Programs Support Services

The College of Computing office is one of three points of support for computer game design students. The other two are offices in the College of Arts and Sciences The   These offices are located in the respective college buildings and are very convenient for students and faculty. The offices are also provided with several work-study positions that are tasked with helping faculty whenever help is requested.

The College of Computing office staff

Name	Title
Richard Hanson	Acting Dean
Kathy Engbrecht	Retention Specialist
Sandra Geuther	Senior Secretary

The College of Arts and Sciences office staff

Name	Title
Ben Jones	Dean, College of Arts and Sciences
Susan Langner	Senior Secretary
Nancy Preshun	Senior Secretary

The search for a College of Computing Dean is underway with expectations for a Fall 2017 start date.

Graduate Programs Office

There is no current graduate program in Computer Game Design

Library Resources and Services

The mission of the Karl E. Mundt Library and Learning Commons is to supply the library and information needs of the students, staff, and faculty of Dakota State University and to support the University's stated mission and goals.

In an information society, information literacy is critical. DSU students should be able to find, evaluate and use information for problem solving and decision making in all aspects of their

lives -- at home, in the workplace, and as informed citizens in a democratic society. The goal of the library is to provide the instruction and tools students need to be effective information users.

A Learning Commons is defined as a student-centered collaborative learning place. Increasing use of technology as a means of accessing information and the recent shift towards cooperative learning and group study have brought changes in the way students use academic libraries and library resources. In the Mundt Library and Learning Commons they are experimenting with new ways to combine information resources, services, technology, and research assistance. They partner with the DSU Retention Specialist to provide space for tutoring, and provide art gallery space managed by the College of Arts and Sciences.

The Library provides access to an extensive collection of materials through its online library catalog which includes the over 4.5 million holdings of more than 70 member libraries of the South Dakota Library Network (SDLN). In addition to its print holdings, the Library subscribes to numerous electronic indexes and full text research databases, most notably, EBSCO's Academic Search Premier, IEEE CS Digital Library, ProQuest Research Library, ABI-Inform, MLA Bibliography, Lexis-Nexis and many, many more. These databases are authoritative scholarly research tools needed to support DSU's academic programs. The Library's website provides the on- and off-campus community with direct access to the information resources critical to the various disciplines. Materials held by other libraries are also readily available through the interlibrary loan system so rarely is the Library unable to quickly meet an individual's information needs. The Library also provides online access to tutorials and other research aids for the independent scholar.

The most important and best resources available are the library staff. These trained professionals are here to help you find and use the resources you need – in person or online by using the "Ask a Librarian" link on the Library's website. In addition to the collections, systems and services offered, library staff provides assistance and instruction to faculty and students through workshops, classroom and one-to-one instruction.

The Library has a wide array of digital equipment like video cameras and digital audio recorders for use by students as well as standard AV equipment like video players and format converters. Meeting rooms, collaboration spaces, study rooms and viewing rooms equipped with TV/DVD/VCR or video projectors connected to various types of players are also available. Many computer peripheral devices like cameras and recording devices are available for check out. Networked computers and scanners are located on the main floor as are many tables equipped with power sources for quick and easy Tablet PC battery recharging between classes.

Peer tutoring services are available in the Tutor Center located on the main floor of the Library. Additional tutorial support is provided online in Lynda.com and Learning Express Library; link to them in the Database Quicklinks drop down box on the Library's main page.

In addition to the collections, systems and services offered, library staff also provide assistance and instruction to faculty and students through workshops, classroom instruction, and one-to-one. Library faculty collaborates with course faculty to ensure students have the research background necessary to complete course assignments. Library faculty develop tutorials, subject guides, and other instructional materials to support classroom learning on campus and at a distance.

It is also the Library's goal to graduate students who are able to find, evaluate, and use information to solve problems and to make decisions effectively. Graduates should have the knowledge and skills to function successfully as continuous learners in a continuously changing information world. To successfully meet its goals, the library provides excellent collections, information systems, services, instruction, and staff. The professional library staff is included in the table below.

Professional Library Staff

Name	Title
Jan Enright	Assoc. VP/ Professor / Library Director
Mary Francis	Assistant Professor / Instruction / Reference Librarian
Open position	Professor / Digital Access & Design Librarian

Technology infrastructure

DSU has an excellent technology infrastructure supporting wired and wireless access to computing resources. Information Technology Services staff provides technology support to faculty, staff, and students.

Lead Information Technology Services Support Staff

Name	Title
Stephanie Baatz	Director of Help Desk Services
Jordan Stewart	Senior Computer Support Specialist
Craig Miller	Director of Networking Services
David Overby	Vice President for Technology & Chief Information Officer
Scott Paulsen	Network Administrator
Brent Van Aartsen	Director of Web Services
Tyler Steele	Multimedia Specialist
Haomin Wang	Manager of Instructional Technology

Online Education Services

Extended Programs is responsible for program planning, marketing, program implementation and overall management of courses and programs offered by alternative delivery (i.e., Internet, DDN) or at off-campus locations by Dakota State University. Working in partnership with the colleges and the institution's academic support areas, Extended Programs works to design and

develop active and collaborative degree programs at a distance or at off-campus sites such as the University Center in Sioux Falls.

The Extended Programs staff is located in the Tunheim Classroom Building. The staff serves the needs of students who are enrolled in the online and videoconferencing courses at DSU and in courses at off-campus locations. The office is the mainstay of distance services to students, working with the administrative offices of DSU to provide these services. The office staff assists faculty in the design and implementation of courses delivered by various forms of technology. Proctoring services for online courses are provided by the Extended Programs office at DSU.

The video conferencing classrooms on campus are located in the Tunheim Classroom Building (TCB). The Dakota Digital Network (DDN) room is located in TCB 103. The Governor's Electronic Classroom (GEC) is located in TCB 111 and the third room is located in TCB 109.

E-Education Services is staffed with the Director of Extended Programs, the Manager of Instructional Technology, an Instructional Technology Specialist, a Communications Network Specialist, the Distance Education Specialist, and a Senior Secretary. This team serves the needs of students who are enrolled in the online and videoconferencing courses at DSU. The office is the mainstay of distance services to students, working with the administrative offices of DSU to provide these services. The staff also serves the Web needs of faculty, staff and students at DSU and the needs related to educational technology. The office staff assists faculty in the design and implementation of courses delivered by various forms of technology.

Extended Programs Support Staff

Name	Title
Sarah Rasmussen	Director of Extended Programs
Abby Roderick	Distance Education Specialist
Annette Miller	Senior Secretary
MingMing Shao	Instructional Technology Specialist

Administrative Staff

Current administrative staff provide the academic support services to successfully deliver undergraduate and graduate programs at DSU. The administrative support personnel who are particularly critical to the delivery of these programs are listed below.

Administrative Support Staff

Name	Title
Jay Kahl	Director of Institutional Effectiveness and Assessment
Kathy Callies	Registrar
Steve Bartel	Director of Student Union/Residence Life

Amy Crissinger	Associate VP for Enrollment Management/Marketing
Heather Gillespie	Director of Bookstore
Jeff Dittman	Director of Athletics
Amy Dockendorf	Controller
Dan Friedrich	Director of Center for the Advancement of Health Information Tech
Denise Grayson	Director of Financial Aid
Angi Kappenman	Director of Human Resources
Sara Hare	Director of Budget & Grants Administration
Javier Lopez	Director of Food Service
Corey Braskcamp	Director of Physical Plant
Kacie Fodness	Director of Sponsored Programs
Marie Lohsandt	Director of Career Services / Assoc Vice President for Student Affairs
Mandy Parpart	Director of Student Activities
Jona Schmidt	Director of Alumni Affairs

Academic Advising

Academic advising is handled by the three CGD faculty members: Drs. Berman, Graham, and Howard. Because the discipline is new and career paths are not obvious, advising in this discipline is unusually demanding. With 100+ students, the advising load is one of the commitments that limits the ability of the faculty to pursue additional opportunities. Additionally, because of the relative complexity of advising for the new discipline, all CGD students are required to meet with their advisor prior to registering for courses each semester. This is in contrast to more major disciplines that have fewer questions during the advising process.

Computer Infrastructure

Information Technology Services (ITS) advances the mission of DSU by ensuring reliable core systems and network infrastructure, excellent technology support, and assisting technology integration into the curriculum and business processes. Information Technology Services is responsible for the planning, management, and direction of technology initiatives in support of both academic and administrative operations at DSU. ITS staff provides the campus community with a diverse set of technology services including:

- Development, monitoring, and maintenance of the campus data network

- Help desk and tablet repair services

- Computer lab and server management

- Administrative application development

- Website and web application development services

- Academic technology training and assistance

- Multimedia services

Working in partnership with the colleges and the institution's academic support areas, Information Technology Services develops the image of applications installed on student tablets. ITS staff operates a help desk and repair center, staffed primarily by students, to quickly respond to any computing or network access problems in campus offices or computing laboratories or with students' tablet PCs.

Financial Support

Support for professional development and training is provided from funds allocated through the Vice-President of Academic Affairs (VPAA) office. Faculty members apply for support up to $1,000 per year, which is available for each faculty member. In addition to these traditional funds, there is also available funding from the VPAA's Office for additional faculty development funding.

PART 7: FACILITIES AND EQUIPMENT

The CGD program has a dedicated Game Lab, used for the junior/senior GAME projects courses. It is a persistent space where teams work on their projects and can leave that work un-interrupted. There are several powerful machines with dual monitors and high-end graphics cards useful for work in 3d-modelling programs and game engines such as Unity and Unreal.

All campus students are required to have a mobile computer. Freshmen and sophomores participate in a program to lease a DSU-issued machine. This standardization is very beneficial to students and faculty. Upper-level students may lease a machine or supply their own device. Through this program the general computing needs are met. The university is able to spend money on wireless infrastructure, specialized hardware needs, power to the tables, bandwidth, etc. rather than turning over general purpose computing labs.

All programs within the College of Computing make use of DSU's Information Assurance (IA) lab. The lab is built upon industry standard hardware and software. In order to provide dynamic use of the hardware resources, a platform of virtualization has been developed in order to allow all students to complete hands on labs in an independent fashion without interference. Students using the lab will not only become more familiar with the topics being taught, but will also become familiar with the use of enterprise level virtualization hardware and software in an environment similar to a realistic business.

Classroom space is adequate but pressured by growing enrollment and increasing class sizes. Space and facility needs will be augmented by the new Beacom Institute of Technology building that has a schedule construction completion date of Fall 2017. This new construction will not solve all of the space challenges but it will allow specialized needs to have a dedicated space. Computer Game Design is one of the programs with dedicated space in the new building to support the project courses and the persistent game development environments provided for the teams, with adjacent space for larger meetings, lectures, presentations, reviews, and other meetings.

As a new program, another challenge for CGD has been scheduling – GAME courses are generally scheduled early or late, to avoid the most congested scheduling times, already claimed by existing disciplines. Additionally, since the CGD program relies on a significant number of skill courses in Computing and Design, our courses have to fit around those courses, which have never been scheduled to coordinate readily.

PART 8: ASSESSMENT AND STRATEGIC PLANS

The assessment plans for the B.S. in Computer Game Design program were developed by the faculty and adhere to the university's guidelines for major-field assessment.

The AQIP assessment process https://public-info.dsu.edu/aqip/ provides for both a general education and major-field and includes an annual evaluation of data linked to measurement of student learning outcomes. Data are aggregated and reported annually in a web-based data table format.

The major assessment weakness recognized by the CGD faculty is that the discipline is new and standards and criteria for assessment are not clearly established. Within the game core of our curriculum, we have made extensive use of 360 degree evaluation, with students evaluated by themselves, their peers, and by their instructors. The game core emphasizes iteration as a key element of the design and development process. We drive that concept home by applying it to the courses in the game core, with a day devoted to feedback on the course and suggestions for improvement. We typically adopt one or more changes to the courses inspired by such feedback. A great deal of the game core is co-taught by members of the CGD faculty, so there is extensive communication among the course instructors and among the leaders of the different courses in the game core.

In concert with the Assessment office and committee, the CGD program has been migrating its techniques toward greater objectivity and repeatability so that more automated collection and analysis of the assessment data is possible.

Additionally, the CGD faculty travels to major game development conference to interact with professional game developers and game academics. We make a point of describing our program to get feedback. As part of the workshop on Integrated Design in Games (IDiG), we bring game professionals and academics to DSU and use that opportunity to seek feedback about the program as well.

Curriculum modifications from Assessment since program creation

- On observation made during the review period was that students were enrolling in upper level GAME courses without sufficient preparation in skills from the Design and Programming core. This was addressed by instituting a series of increasing prerequisiites for the GAME courses which require skill courses from the Design and Programming core prior to the GAME courses.

- Another curricular change was the introduction of Emphasis Areas, so that students could take significant course work in one of the skill areas contributing to game design and development: Software, Narrative, or Game Art. These emphasis areas require 30 credits of coursework beyond the degree requirements in on of the particular skills.

- A final curricular change that was instituted based on observations, was coordinating with the CSC department to facilitate double majors in Computer Science and Computer Game Design, while not compromising the rigor of either degree.

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Additional curriculum changes based on previous informal assessment include modifications to the curriculum (currently in the approval process) by adding:

- GAME 101 an essential games course (1 credit) – replacing GS100 course
- GAME 220 Game programming tools(3 credit)
- GAME 261 Worldbuilding

Assessment Reports Background

Assessment Reports at Dakota State University are completed the year prior to Program Review. These Reports are generated at this time to give faculty members and their respective Dean/Chair enough time to review results and begin an action plan for changes they would like to see with student learning and general program outcomes. In this way, the Assessment Report offers a time for reflection of past practices as they relate to student learning and preparedness, so that the year of Program Review can focus on space, staffing, funding, and any other supporting structures to student learning.

Data

The following Report was generated by the Office of Institutional Effectiveness and Assessment and the Department of Computer Game Design. It covers the Computer Game Design program at the Bachelor's level and focuses on the following goals for the program:

- Goal #1 – Graduates will be prepared for entry-level positions in the Computer Industry
- Goal #2 – Graduates will be knowledgeable and competent users of computer technology

Currently, this is measured by Alumni and Employer surveys, creation and review of portfolios, and the creation of playable computer video games.

See the attached file: compilation of data.

Summary of findings:

- The program has grown from zero students in 2008 to 100+ for the past few years.
- The program has graduated a total of 43 students, with the first graduates of the program during the 2012-2013 school year.
- The program has attracted students from a wide variety of states (wider than is typical for DSU programs).
- The program has contributed to other programs by attracting students to DSU for the CGD major who then transfer to other majors (9% per year, versus 1% of students transferring into CGD from other programs).
- Students have been successful in finding work related to their major and in continuing on for further study (e.g., Vancouver Film School, NYU Game Center). *The DSU Employer Survey is administered to the employers of DSU graduates 1 year after graduation. The survey was revised in 2010; the results are on a 4-point likert scale 1=Does not meet expectations 2= Meets expectations 3= Exceeds expectations 4= Greatly exceeds expectations. "Non-Applicable" responses on surveys are not included.*

While the number of alumni available was limited for the first alumni surveys, the results were as follows:

- Respondents rated DSU academic programs as Above Average.
- Respondents rated academic advising as Excellent.
- Respondents rated career preparation as Good.

The DSU Alumni Survey is administered to graduates at 1 year and 3 years post-graduation. For example: The 2015 Alumni Survey was completed by 2013-14 graduates (1 year) and 2011-12 graduates (3 years post-graduation) – but there were no graduates from the program for those years.