NTID Visual Communications Studies Department

3D Graphics Technology program proposal

Kurt Stoskopf and Heather Smith, Co-authors
Kathy Olsen, Paula Grcevic, Committee Members
Kurt Stoskopf, VCS Chairperson

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1. PROGRAM DESCRIPTION AND PURPOSE

Provide a narrative overview of the proposed (or revised) program that includes the following:

a. Provide a brief description of the program, as it will appear in the institution's catalog.

The NTID 3D Graphics Technology Associate of Applied Science program introduces concepts related to three dimensional (3D) graphics, and teaches students the creative and technical skills required to produce 3D graphics, 3D prints, environmental renderings that range from artistic to photorealistic in quality, and 3D models used in multimedia and animation. A combination of traditional design skills and digital design techniques are taught, along with concepts of time, motion, and lighting principles. This program will prepare students for either one of two educational and career options: entering the 3D graphics industry after graduation, or continuing their studies at the baccalaureate degree level in the 3D Digital Design program in the College of Imaging Arts and Sciences.

b. List educational and (if appropriate) career outcomes. Describe any specific curricular features that incorporate rigorous academic and career preparation.

In supporting the Institute's goal for student career preparation, the 3D Graphics Technology program (3DGT) will attract qualified students who have an interest in working in the 3D graphics field at the AAS degree level, and who possess creative visual communication skills. The program will prepare and train students for entry-level employment in the 3D graphics industry. The 3D Graphics Technology program will cover the artistic and technical sides of the industry, with a specific focus on the modeling, animation, and visualization processes in 3D graphics. Students will acquire the creative and technical skills required to create 3D graphics, 3D printouts, environmental visualization graphics, and 3D models used in multimedia and animation.

The program will also require students to acquire skills in traditional media drawing and painting, as well as in animation, modeling, 3D printing, reading and understanding design plans, blueprints, and to acquire computer-based skills in 2D and 3D graphics software. In addition, students will acquire skills related to project management and teamwork.

The educational and career goals (numbered) and outcomes (with lowercase letters) for the 3DGT program are:

1. Develop a high degree of technical competence in traditional media drawing and painting, as well as in animation, modeling, 3D printing, and computer-based skills in 2D and 3D graphics software.

    a. Use appropriate software applications and hardware systems in the design and production of 3D graphics projects.
2. Develop the essential skills necessary for entry-level employment in the 3D graphics industry.
    a. Demonstrate effective writing and presenting skills for career preparation.
    b. Demonstrate technical skills and preparation for 3D graphics job market.

3. Demonstrate effective project management and teamwork skills.
    a. Manage and deliver quality projects from theoretical concept to final product on time, on budget, and in compliance with industry standards and sustainability guidelines.

4. Develop effective communication, collaboration, and interpersonal skills.
    a. Work collaboratively in multidisciplinary teams, formulating and responding to constructive team and individual feedback.
    b. Communicate effectively with peers, design and production professionals, and clients using design and production concepts
    c. Demonstrate appropriate writing skills and use of technical vocabulary.

5. Demonstrate the creative and technical skills required to create 3D graphics, 3D printouts, environmental visualization graphics, and building 3D models used in multimedia and animation.
    a. Exhibit individual competence in 3D Graphics and production of professional quality 3D media.

6. Demonstrate the knowledge and skills necessary to function in a global society.
    a. Describe the interrelatedness of social, cultural, and visual communication factors that shape and impact the global 3D graphics industry and marketplace.

The N3DG-270 Capstone course offered at the end of the 3DGT program sequence offers students the opportunity to apply their skills towards an applied skill-focused project that will be done with advice and guidance of faculty from the Visual Communications Studies department. The structure of the Capstone course is that of a self-directed, semester-long project that is done either on an individual basis or as part of a team-based project. The purpose of this course is to allow students to identify a particular skill set or topic within the field of 3D graphics and explore the subject in depth, with the goal of creating a project that highlights students' skills in that particular area. Students will incorporate this project into their demo reel, which is a visual portfolio of the students' work and which helps employers identify students' capabilities within their chosen subject area.

c. Describe how the program fits with and advances the institution's mission, vision, values and reputation.

The program proposal addresses the following criteria in the Academic Portfolio Blueprint, and is expanded upon in subsequent sections of the proposal.

1. **Centrality**
   The 3D Graphics Technology program will be a new addition to the NTID educational portfolio that will allow students to earn an Associate of Applied Science (AAS) degree in the field of 3D graphics. Following the RIT Academic Portfolio Blueprint's criteria of Centrality, this program will be a new addition to the technical educational opportunities for students at the associate degree level.

   a. From RIT's mission, "We rigorously pursue new and emerging career areas. We develop and deliver curricula and advance scholarship relevant to emerging technologies and social conditions." Currently in NTID's educational portfolio, especially in the Visual Communications/Graphic Arts field, there is no existing program that covers the subject area of 3D graphics. This program will fill the identified gap in NTID's academic offerings.

2. **Marketability**
   a. There are no other associate degree programs in 3D graphics that focus on deaf students. NTID will become the first college to offer this kind of program to its targeted demographic. Having the first 3D graphics associate's program focused on deaf students will add to the mission, values, and reputation of RIT by differentiating itself from other peer universities.

   b. With the growth for work opportunities for students, the 3D Graphics Technology's AAS degree will provide students exposure and opportunities in individual and team-based experiences that cover both the creative and technical areas of 3D graphics. The technical and creative focus of the 3D Graphics Technology associates' degree program, its co-operative work experience requirement, along with the program's capstone course will encourage the development of students who "…are responsible, hard-working, critical thinkers who pursue personal and professional growth with diligence, pride and spirit" (RIT A02.0 Key Results and Goals).

   c. The specialized nature of technical skills and creative skills required for the 3D Graphics Technology program will attract a pool of students that may not normally come to NTID if a 3D graphics program were not available. There will be a minimal impact on enrollment for the Design and Imaging Technology program if this program is approved. The higher admissions criteria for the AAS degree in3D Graphics Technology program will exclude the majority of students who enter the Design and Imaging Technology program at the AOS degree level.

3. **Quality**

The field of 3D graphics has grown in scope over the last few years, with increasing usage in the entertainment, design, computer, medical, science, and construction fields. In the spirit of RIT's values, the 3D Graphics Technology program will foster opportunities for student experiential learning, creativity, and practical applications of the creation and development of three dimensional imagery that can be used in collaborations that occur across different disciplines, following in the spirit of RIT's values of collaboration, openness, and innovation.

This program addresses RIT's Academic Portfolio Blueprint characteristics of synergy and interdisciplinarity by creating a new program and combining courses from the NTID VCS department's Design and Imaging Technology program with new courses to foster integration between the two programs, as well as between the colleges of NTID and CIAS through the establishment of a transfer articulation agreement between the two colleges of RIT indicated in depth in section 1.f. of this document.

a. The requirements for accreditation by the National Association of Schools of Art and Design (NASAD) will ensure that the quality of instruction and curricular approaches remain of the highest quality, following the guidelines set forth by the accrediting organization. NASAD is "…an organization of schools colleges, and universities. It has approximately 323 accredited institutional members. It establishes national standards for undergraduate and graduate degrees and other credentials" (http://nasad.arts-accredit.org/). The organization sets standards and peer reviews member schools every 5-10 years.

4. Financial Viability

a. As summarized on the NTID Cost Model on pages 184-188, the program will be financially viable, with expenditures balancing out with revenue. This is in keeping with NTID budgetary guidelines, which include utilization of NTID tuition and federally appropriated funds. The 3DGT program will be created, developed, and managed using the Visual Communication Studies annual budget. The expectation is for minimal additional costs, as shown on page 30, and no new faculty hiring, as described on page 21.

d. Describe the justification and documented need for this program and how this program contributes to RIT's strategic plan priorities and key result areas.

From the RIT Strategic Plan, and its mission statement:

"Our mission is to provide technology-based educational tracks for personal and professional development. We rigorously pursue ***new and emerging career areas****. We develop and deliver curricula and advance scholarship relevant to emerging*

technologies and social conditions."

The 3D Graphics Technology program will be a new addition to the NTID academic portfolio that will allow students to earn an associate degree in new and rapidly growing fields and will lead to opportunities for students to enter baccalaureate degree tracks in the 3D Digital Design program at RIT. The growth of this area over the last few years in the consumer market has been exponential, and the use of the technologies and products from multimedia to 3D printing and architectural visualization has had an impact on the daily experiences of today's increasingly computer-literate society. The proposed program will allow our students to have an opportunity to acquire technical skills and knowledge to pursue entry-level careers in the 3D graphics industry, or prepare them for further study at the baccalaureate degree level.

At a person-to-person level, when faculty attended the SIGGRAPH[1] conference in Vancouver, they made contacts with companies there and asked about opportunities for students with associates' degrees in the 3D graphics industry. The response from many companies was that they wanted to see a good "demo reel" or a portfolio of work, and upon seeing that, would determine their hiring decisions, not so much the type of degree the student receives. Studio D, a 3D stereoscopy company, replied at the conference that they preferred students fresh out of college, who were ready to be trained by the company to work using *their* (emphasis is theirs from conversation) workflow and processes, and were given a two week training session with an evaluation prior to hire. They showed interest in working with students from our possible program, and offered to provide training to faculty so that they could assist students in applying for jobs in the 3D stereoscopy field. With the contacts the faculty made at the conference and have continued since the conference, the program is working towards increasing industry contacts and recognition of NTID at RIT to satisfy Goal 4: Increase percentage of graduating students with employment offers or graduate school acceptances of the Key Result Area 1: RIT Will Be Renowned for Student Success of A02.0 Key Result Areas and Goals.

From a macro-view, Marketsandmarkets.com, a market research company, describes the computer graphics industry, of which 3D graphics is a part. It describes computer graphics, stating it is not only limited to supporting and designing multimedia content but encompasses a wide horizon of software with ever expanding applications. "Advancements in computer graphics software have changed the way humans and machines interact and communicate. Computer graphics allow users to understand complex ideas with different perspectives, which are impossible to understand in real life. These graphics software are being employed by businesses around the world to improve efficiencies of their business processes along with enhancing and innovating product design and features. Complex engineering machines, architectural marvels, sophisticated next generation aircraft and spacecraft among others are possible as a result of applications of computer graphics software. Computer graphics are being used

[1] A special interest group of the Association for Computing Machinery (ACM) for professionals interested in computer graphics and interactive techniques.

across various verticals such as architecture, aerospace and defense, automobile, manufacturing, healthcare, academics, and entertainment" (http://www.marketsandmarkets.com/PressReleases/computer-graphics.asp)

The NTID Admissions department has recently seen a growth in the number of students expressing interest in the 3D graphics industry, and also students expressing interest in enrolling into the CIAS 3D Digital Design baccalaureate program. Students accepted to NTID who arrive qualified for the associate degree level programs need further skill preparation before they meet the admissions criteria at the baccalaureate degree level. With this growth, from the addition of this program, RIT and NTID will be able to give students the knowledge and training necessary at the associates' degree level and to support their efforts to continue on to their goals of studying for their baccalaureate degree or seeking employment in the 3D graphics industry after graduation with their associate's degree. The addition of the 3D Graphics Technology program will support NTID's satisfaction of Goal 12 of the Key Result Area 4: Achieve the Highest Levels of Stakeholder Satisfaction of the A02.0 Key Result Areas and Goals: to increase undergraduate, graduate, and out-of-state undergraduate applications.

Information provided to us from the NTID Admissions office offers a breakdown of students' interest in the 3D Graphics Technology program compared to other visual technology programs over the last several years below:

Program	2011	2012	2013
Film/Animation BFA	23	19	15
Video Game/Development BS	30	27	24
3D Digital Design	6	12	18
New Media Design and Imaging	2	3	4

The data represented here shows that there is a demonstrable growth in student interest and demand for a degree in 3D graphics.

The US Government Bureau of Labor Statistics classifies 3D graphics under the "Multimedia Artists and Animators" category, and its most recent data indicates that they project a 6% growth rate, which falls in the "moderate" growth rate category when compared to all other labor areas (http://www.bls.gov/ooh/arts-and-design/multimedia-artists-and-animators.htm). Marketsandmarkets.com published research supports the data found in the BLS report and expands further on the statistics, stating "…The computer graphics market is estimated to grow from $23.33 billion in 2014 to $32.68 billion in 2019 at a Compound Annual Growth Rate (CAGR) of 6.97% from 2014 to 2019. On geographical grounds, North America (NA) is forecasted to be the biggest market for computer graphics followed by Asia-Pacific and Europe. APAC region will experience the highest growth rate, growing at a CAGR of 10.7%" (http://www.marketsandmarkets.com/PressReleases/computer-graphics.asp)

The marketplace for employment in the 3D Computer Graphics area has grown considerably, and jobs can be found worldwide. Generally, jobs can be found that are full-time, part-time, or on a contract basis; however, the nature of employment in this industry is primarily on a per-project basis. Many of the jobs in the 3D graphics industry are contract based, and while there are competition for employment at all levels, many entry-level jobs can be found in the 3D computer graphics industry. For employment, students in the 3D Computer Graphics program will be prepared and qualified for obtaining entry-level employment in the industry, finding jobs with titles such as: Junior Computer Graphic Designer, Junior Computer Animator, Technical Illustrator, 3D Illustrator, 3D Animator, Junior Environment Artist, Junior Animator, 3D Generalist, Modeler, Animator, Texture Artist, 3D Visualization Artist, and Rigger.

e. Describe curricular features that:

- **Facilitate and support student and faculty scholarship, research and creativity.**
- **Address emerging disciplines.**

The N3DG-270 Capstone course has been identified as the course that will allow for expansion of student technical skill sets and allow students to work on a self-directed project over one semester. Faculty teaching the course in planning and completing their project will guide the capstone project. In this course, students will explore a topic in depth and apply their technical skills and creativity to their capstone project. In the capstone project, students will identify and explore a subject or content area in the 3D graphics industry and work on a semester-long project where they will develop, complete, and present their project to faculty and students in the 3D Graphics Technology program. This course will allow the program to contribute towards satisfying the Key Result Area 2, Goal 5, of A02.0 Key Result Areas and Goals: Provide opportunities for 100% of RIT students to experience innovation, creativity, and scholarship.

The 3DGT program will offer a schedule of courses that address the discipline areas of 3D modeling, Lighting and Texturing, Animation, and 3D printing in the 3D graphics field by the use of state-of-the-art software and hardware in the classroom. The use of software and hardware also carries into the areas of student and faculty technical skill development and application of creativity to projects, which are supported in part by curricular elements found in all courses offered by the 3DGT program.

f. Excepting general education requirements, describe and list documented curricular interconnections and integration between this program and other disciplines, programs and colleges at the University (e.g., minors, concentrations, BS/MS options).

There are two identified points of curricular interconnections that will take place during students' course of study in the 3D Graphics Technology program. The first is with the NTID Visual Communication Studies' Design and Imaging Technology program, and later, at the end of their course of study, the second, with the College of Imaging Arts and Sciences 3D Digital Design BFA program.

At the beginning of the students' course of study in the 3D Graphics Technology program, they will take two courses from the Visual Communication Studies Design and Imaging Technology program to develop foundation skills in graphics software and understanding the relationship of color and design by taking NAIS-130 Raster and Vector Graphics and NAIS-120 Principles of Design and Color. These two courses will introduce students to the common language and concepts that are shared across the Graphic Design and 3D Graphics Technology programs.

After students complete their associate degree in the 3D Graphics Technology program, they can decide between one of two options: to enter the workforce, or to pursue further study at the baccalaureate degree level at RIT. If students choose to continue their studies at the baccalaureate degree level at RIT, they can then apply for acceptance into the BFA program in the *3D Digital Design* (3DDD) program in the School of Design in the College of Imaging Arts and Sciences at RIT.

The Visual Communications Studies' 3D Graphics Technology curriculum committee have worked closely with the chair and faculty of the 3D Digital Design program in the College of Imaging Arts and Sciences to get insights and feedback on the proposed 3D Graphics Technology program curriculum. While developing the proposal for the NTID 3D Graphics Technology program, the authors built relationships with faculty in the 3D Digital Design program in the College of Imaging Arts and Sciences.

The CIAS 3D Digital Design program has indicated their support for our proposed program and has stated their willingness to accept qualified AAS graduates from our program to their BFA program with transfer credits being accepted from the AAS program to the BFA program. Based on this relationship, the 3D Graphics Technology program has developed and established a transfer articulation agreement with the 3D Digital Design BFA program in the School of Design that allows students who graduate with their AAS degree to apply and be accepted into the sophomore or junior year level of the BFA program, depending on their GPA and evaluation of their demo reel. This is the first formal transfer articulation agreement established between the colleges of NTID and CIAS. The development of the transfer articulation agreement supports RIT's Academic Portfolio Blueprint section III.h criteria: how it will foster integration within, between, and among disciplines, programs, and colleges.

The transfer articulation agreement can be found starting on page 44.

g. Describe the role of faculty in the program's design.

The faculty in the Visual Communications Studies department were involved in the program's conception and design with Kurt Stoskopf and Heather Smith being the co-authors of the program. There were five faculty members on the committee for the program's proposal and curriculum design, Kurt Stoskopf, committee chair; Ken Hoffmann, former VCS chairperson; Heather Smith, Kathy Olsen, and Paula Grcevic.

The responsibilities were divided up among the five members, and each researched and developed linkages with external faculty and industry professionals. Two faculty members attended SIGGRAPH, an international 3D graphics conference, and used the knowledge obtained from the conference and committee research to develop and refine the curriculum and program proposal.

h. Describe the input by external partners, if any (e.g., employers and institutions offering advanced educational programs). In your response, draw from the information you have solicited from external partners reported in <u>Appendix D</u>.

We identified, requested, and received two letters of support from companies knowledgeable about working with deaf employees, and who are involved in the Simulation and Architecture industries. Both companies stated that there is a need for students who learn skills taught in the 3D Graphics Technology program. They also say that students from NTID will be employable after graduation with an AAS degree.

Michael Bryant from Bryant Design Studio had this to say about our program in his letter of support:

"…have determined that the 3D Graphics Technology program will provide students with a strong foundation of knowledge that would qualify students for entry level jobs in the architectural, gaming and movie industries."

From their letter of support, Camber Corporation said:

"Yes, a graduate could be employed from our company, along with skilled and impressive portfolio."

"Our prediction, the 3D graphic industry will grow from 5 to 10 years from now, as the technology grows, and more schools build curriculums that teach 2D/3D graphics."

When asked about potential limitations for deaf students, Olivier Manuel, from Camber replied during a discussion with him:

"As far as limitations, I can't think of many except for learning to animate with voice audio for characters. Although, I see students may have an advantage by already knowing phonemes and reading lips when it comes to making facial blend shapes on character heads in 3D."

Also, when asked about the viability of an AAS degree and the need for advanced degrees after graduation, Olivier Manuel from Camber replied:

A graduate would not be expected to receive an advanced degree as long as the curriculum covers all the subject matter needed for 3D since there is more than 1 type of field to go into. For example, learning 3D modeling and animation might not be enough. It would be useful to learn rigging, lighting, texturing as well. Smaller companies may need a 3D generalist who has to handle all those fields. Bigger companies will hire specialized artists, a modeler may strictly just do that and not have to light or rig.

The overall response from the two companies was positive and both support the development of the 3D Graphics Technology program as a viable educational and career goal for students attending NTID at RIT.

i. Provide enrollment projections for Year 1 *through* Year 5. (In arriving at these projected enrollments, consult with Enrollment Management. Include other documentation and provide a formal certification of enrollment projections from VP for Enrollment Management and Career Services in Appendix B, which explains the underlying enrollment assumptions and projection model.

A summary of the enrollment projections is shown below. We anticipate initial enrollment to be 8 students in year one, growing to 9 incoming students in year two and 10 incoming students each subsequent year. A 70% graduation rate is anticipated. The full enrollment projection table is shown in *Appendix B*. It indicates for each of the first five years, the number of internal transfers, students who would come to NTID regardless of whether or not we had this program, and students we anticipate new to NTID who would come specifically to enroll in this program. Both the summary chart below and the full chart in Appendix B incorporate persistence over the 5 semesters of the program for each incoming cohort as well as their graduation expectations. Additionally, Appendix B contains the rationale and procedures used to calculate the expected graduation rate of 3DGT students.

Dr. James Miller, RIT Vice President of Enrollment Management and Career services, has formally certified the enrollment projections and anticipated graduate rates, saying, "Having reviewed the proposal, I find the detailed projections provided by Scott Hooker (NTID Director of Admissions) and Rich Dirmyer (NTID Director of Institutional Research and Assessment) supportable as stated."

3DGT 5 year enrollment projections

Enrollment	Year 1 AY16-17	Year 2 AY17-18	Year 3 AY18-19	Year 4 AY19-20	Year 5 AY 20-21
Enrollment Fall Semester	8	16	25	27	28
Enrollment Spring Semester	8	16	18	19	19
Total Semesters of Enrollment	16	32	43	46	47

2. PROGRAM COURSES AND SCHEDULE

As shown in Table 1a, the 3D Graphics Technology AAS program consists of 73 credits taken over five semesters with a required cooperative work experience taken after the fourth semester. There are 48 credits of technical courses, 24 liberal arts and sciences credits, a one-credit Freshman Seminar course, plus wellness. An ASL-Deaf Cultural Studies (AASASLDCS) course is also required for graduation. It can be taken in any semester and can be taken at NTID or another college of RIT. In order to fulfill this requirement as part of the 73 credits in the program, it should be a course approved for *both* AASASLDCS *and* an LAS Perspective.

Please refer to page 15 for Table 1a for the course sequencing used for a typical student's progress through the 3DGT program, and where the General Education courses are identified and required for the student in the program course sequence.

Below are the Technical Courses shown in Table 1a for 3DGT:

1. VCS existing courses
    a. NAIS-120 Principles of Design and Color
    b. NAIS-130 Raster and Vector Graphics
    c. NAIS-201 Employment Seminar
    d. NAIS-292 Portfolio Workshop
    e. NAIS-299 Co-op
2. New N3DG courses
    a. N3DG-100 Design Drawing
    b. N3DG-110 Basic 3D Modeling
    c. N3DG-115 Intermediate 3D Modeling and Techniques
    d. N3DG-140 3D Lighting and Materials
    e. N3DG-210 Advanced 3D Modeling and Techniques
    f. N3DG-220 Principles of 4D Design
    g. N3DG-225 3D Motion
    h. N3DG-230 3D Printing
    i. N3DG-260 Professional Practices
    j. N3DG-270 Capstone
3. Two technical electives

Below are the AAS general education requirements shown in Table 1a for 3DGT:

1. Foundation Courses
    a. First Year LAS Elective
    b. First Year Writing: UWRT-150 Writing Seminar
2. Perspectives
    a. LAS Perspective 1 (Ethical)
    b. LAS Perspective 2 (Artistic) ARTH-135 Survey of Western Art and Architecture I
    c. LAS Perspective 3 (Global) ARTH-136 Survey of Western Art and Architecture II
    d. LAS Perspective 4 (Social)

    e. LAS Perspective 6 (Scientific Principles)
3. General Education Elective (NMTH-120 or higher for NTID AAS programs)

PROGRAM COURSES AND SCHEDULE

Table 1a: Undergraduate Program Schedule-3D Graphics Technology AAS

- Indicate academic calendar type: _X__Semester ___Quarter ___ Trimester ___Other (describe)
- Label each term in sequence, consistent with the institution's academic calendar (e.g., Fall 1, Spring 1, Fall 2)
- Copy/expand the table as needed to show additional terms

ASL/Deaf Cultural Studies*											
Term: Fall 1		Check course classification (s)				**Term: Summer 2**		(Check course classification (s)			
Course Number & Title	CR	LAS	Maj	New	Prerequisite(s)	**Course Number & Title**	CR	LAS	Maj	New	Prerequisite(s)
NAIS-130 Raster and Vector Graphics	3		X			NAIS-299 Co-op	0		X		NAIS-201
N3DG-100 Design Drawing	3		X	X							
N3DG-110 Basic 3D Modeling	3		X	X							
NCAR-100 Freshman Seminar	1										
First Year LAS Elective	3	X									
Term credit total:	13	3	9			Term credit total:	0		0		
Term: Spring 1		Check course classification (s)				**Term: Fall 3**		(Check course classification (s)			
Course Number & Title	CR	LAS	Maj	New	Prerequisite(s)	**Course Number & Title**	CR	LAS	Maj	New	Prerequisite(s)
NAIS-120 Principles of Design and Color	3		X			N3DG-270 Capstone	3		X	X	NAIS-299
N3DG-115 Intermediate 3D Modeling and Techniques	3		X	X	N3DG-100, N3DG-110	NAIS-292 Portfolio Workshop	3		X		Second year program status
N3DG-140 3D Lighting and Materials	3		X	X	N3DG-100, N3DG-110	LAS Perspectives 1	3	X			
First Year Writing UWRT- 150 Writing Seminar	3	X				LAS Perspectives 4	3	X			
Wellness Education	0					LAS Perspectives 6: NSCI-120 or higher	3	X			
LAS General Education Elective NMTH-120 or higher	3	X									
Term credit total:	15	6	9			Term credit total:	15	9	6		
Term: Fall 2		Check course classification (s)				**Term:**		Check course classification (s)			
Course Number & Title	CR	LAS	Maj	New	Prerequisite(s)	**Course Number & Title**	CR	LAS	Maj	New	Prerequisite(s)
NGRD or NGRP Elective #1	3		X								
N3DG-210 Advanced 3D Modeling and Techniques	3		X	X	N3DG-115						
N3DG-220 Principles of 4D Design	3		X	X	N3DG-115						
NAIS-201 Employment Seminar	3		X		Second year program status						
LAS Perspectives 2: ARTH-135 Survey of Western Art and Architecture I	3	X									
Term credit total:	15	3	12			Term credit total:					
Term: Spring 2		Check course classification (s				**Term:**		Check course classification (s)			
Course Number & Title	CR	LAS	Maj	New	Prerequisite(s)	**Course Number & Title**	CR	LAS	Maj	New	Prerequisite(s)
NGRD or NGRP Elective #2	3		X								
N3DG-225 3D Motion	3		X	X	N3DG-220						

N3DG-230 3D Printing	3		X		N3DG-210							
N3DG-260 Professional Practices	3		X		NAIS-201							
LAS Perspectives 3: ARTH-136 Survey of Western Art and Architecture II	3	X										
Term credit total:	15	3	12			Term credit total:						

Program Totals:	**Credits: 73**	**Liberal Arts & Sciences: 24**	**Major: 48**	**Elective & Other: 1**

Cr: credits **LAS:** liberal arts & sciences **Maj:** major requirement **New:** new course **Prerequisite(s):** list prerequisite(s) for the noted courses

* An ASL-Deaf Cultural Studies (AASASLDCS) course is required for graduation. It can be taken in any semester and can be taken at NTID or another college of RIT. In order to fulfill this requirement as part of the 73 credits in the program, it should be a course approved for *both* AASASLDCS *and* an LAS Perspective.

a. For every required course provided by a department other than the program's home department, provide a memo of support in Appendix C from that department, which includes an estimate of incremental costs for offering additional sections or new courses for the proposed program.

Please refer to *Appendix C, Section 1, Memos of Support* on page 111 for copies of memos of support/impact statements from departments that will be offering courses used by students in the 3DGT program. In Appendix C, we document that we have received confirmation from the respective departments that are impacted by the addition of the new program that they are able and willing to support the additional student enrollment into their courses.

b. If the program will be offered through a non-traditional schedule (e.g., off-campus, on-line, etc.), provide a brief explanation of the schedule, including its impact on financial aid eligibility.

N/A

c. For existing courses that are part of the major, submit a copy of the current catalog description.

Courses from the Design and Imaging Technology program of the Visual Communications Studies department

NAIS-120 Principles of Design and Color
Students will be introduced to the basic elements of two-dimensional monochromatic and color design, compositional principles, and approaches to analysis of design problems. Techniques for gathering resources to work toward possible design solutions and visualization of design concepts through the use of idea sketches to final comprehensive layouts. Color theory will be introduced. Students will also utilize basic design vocabulary to participate in critiques for the purpose of analyzing their own and other students' work. This course provides students in non-creative technical majors as well as those pursuing more creative endeavors within the graphic arts field with a fundamental overview and understanding of the design process to expand critical awareness of the importance of good design. **Class 2, Lab 3, Credit 3 (F, S**)

NAIS-130 Raster and Vector Graphics
This course introduces students to the skills needed for the successful production and manipulation of raster and vector images using image creation and production software. Students will work in bitmap and vector applications, producing and editing with the tools and techniques offered by the software programs such as selection techniques, basic layer controls, digital masking, image correction and enhancement. Additional topics will include the relevance of image size, resolution and file format specifications when working with raster and vector images. Comprehension and correct usage of terminology and concepts are emphasized. **Class 2, Lab 3, Credit 3 (F, S)**

NAIS-201 Employment Seminar
Provides students with an opportunity to prepare for co-op and permanent employment through activities including developing and revising resumes, cover letters and portfolios, completing forms, interviewing, developing strategies for finding job opportunities, and researching targeted companies. Discussions relating to personal finance, communication strategies, adapting to the workplace, tips for job success, and workplace expectations will be included. (2nd year in program status) **Class 3, Credit 3 (F, S)**

NAIS-292 Portfolio Workshop
This course will give students from all areas of study in the Arts and Imaging Studies Department an opportunity to prepare and submit portfolios of their work for final review by a jury composed of department faculty members and professionals. The course will emphasize professional procedures, work habits, and demonstration of creative and technical skills, depending on the students' areas of expertise, as well as appropriate communication with clients, presentation techniques, and ability to work as a fully contributing member of a team. (Second year or greater status) **Class 2, Lab 3, Credit 3 (F, S)**

Courses from the College of Imaging Arts and Sciences

ARTH-135 Survey of Western Art and Architecture I
The subject of this year-long course is the history of western art and architecture from prehistory through the early 20th century. We will examine the form, style, function, and meaning of important objects and monuments of the past, and consider these in their social, historical and cultural contexts. A chronological study will allow us to recognize when, where and by whom a given object was produced. Once these decisive factors are established, we may try to determine why the object was made, what it meant in its time, place and culture, and whose ideology it served. Since we are dealing with visual information, the primary goals of this class are to learn how to look, and how to describe and analyze what we see. At the end of the year, students will be prepared to pursue more advanced courses in the discipline, for they will have gained a foundational knowledge of the object, scope and methods of art history. The knowledge obtained in this introductory course will also guide students in their own creative endeavors. **Class 3, Credit 3 (F, S)**

ARTH-136 Survey of Western Art and Architecture II
The subject of this year-long course is the history of western art and architecture from prehistory through the early 20th century. We will examine the form, style, function, and meaning of important objects and monuments of the past, and consider these in their social, historical and cultural contexts. A chronological study will allow us to recognize when, where and by whom a given object was produced. Once these decisive factors are established, we may try to determine why the object was made, what it meant in its time, place and culture, and whose ideology it served. Since we are dealing with visual information, the primary goals of this class are to learn how to look, and how to describe and analyze what we see. At the end of the academic year, students will be prepared to

pursue more advanced courses in the discipline, for they will have gained a foundational knowledge of the object, scope and methods of art history. The knowledge obtained in this introductory course will also guide students in their own creative endeavors. (ARTH-135 Survey of Western Art and Architecture I) **Class 3, Credit 3 (S)**

Other courses

NCAR-100 Freshman Seminar
The course provides entering NTID students with opportunities to develop/enhance academic skills, personal awareness, and community involvement in order to maximize their college experience. Students have opportunities to explore and navigate the college environment, develop/reinforce academic skills and participate in service learning opportunities. Students are encouraged to establish meaningful connections with faculty, staff and peers. The course promotes the development of plans for ongoing growth and involvement in class and in the RIT/NTID and/or broader community. **Class 1, Lab 1, Credit 1 (F, S)**

UWRT-150 First Year Writing: Writing Seminar
First Year Writing is a three-credit seminar limited to 21 students per section. The course is designed to develop first-year students' proficiency in analytical writing, rhetorical reading, and critical thinking. Students will read, understand, and interpret a variety of texts representing different cultural perspectives and/or academic disciplines. Academic, non-fiction texts, chosen around a particular theme, are designed to challenge students intellectually and to stimulate their writing for a variety of contexts and purposes. Through inquiry-based assignment sequences, students will develop academic research and literacy practices that will be further strengthened throughout their academic careers. Particular attention will be given to the writing process, including an emphasis on teacher-student conferencing, self-assessment, class discussion, peer review, formal and informal writing, research, and revision; small class size promotes frequent student-instructor and student-student interaction. The course also emphasizes the principles of intellectual property and academic honesty for both current academic and future professional writing. **Class 3, Credit 3 (F, S, Su)**

d. For all new courses, provide course outlines in the major using RIT's New or Revised Course Outline Form. (Form is available in Appendix A) Course outlines should include a course description, course credit, objectives, topics, student outcomes, texts/resources and basis for determining grades.

Please refer to *Appendix A, New Course Outline Forms* on page 51, for the course outline forms of all new courses that will be used as part of the 3DGT program curriculum.

3. FACULTY

Provide information on Full-time faculty, Part-time faculty and Faculty to be hired in the Program using Tables 2, 3, and 4.
Note: Full faculty Curricula Vitae must be included in Appendix F.

Please refer to the following pages for the completed Tables 2, 3, and 4. The collection of full faculty Curricula Vitae can be found in Appendix F on page 126.

FTE faculty allocated for the program will be 2.86 FTE. This includes faculty listed below in Table 2 who will teach the 3D Graphics Technology required technical courses, as well as faculty needed to teach the NGRP and NGRD technical electives, and LAS math and science courses. This does not include faculty to teach the LAS Foundation and LAS Perspectives 1 and 4 courses taught by COLA or the LAS Perspectives 2 and 3 courses which are housed in CIAS. See letter of support from James Winebrake in Appendix C and footnote on Cost Model Table 1 regarding those courses.

No new faculty will be hired for the 3D Graphics Technology program and there will be no negative impact on the current Digital Imaging Technology AAS and AOS programs offered by the Department of Visual Communications Studies. This is because VCS has had a large number of retirements of tenured faculty in the past several years who have been (or are being) replaced by lecturers, which has created additional teaching capacity in the department. Additionally, with the conversion to semesters, VCS had a large number of graduations and there is room in NGRP and NGRD elective courses to absorb the anticipated additional enrollment.

Table 2: Current Faculty, Full-Time

Provide information on faculty members who are full-time at the institution and who will be teaching each course in the major field or graduate program. *Include and identify the Program Director.

Faculty Member Name and Title/Rank at Institution (include and identify Program Director)	Expected Program Course Assignments**	Percent of Teaching Time to Program	Highest and Other Applicable Earned Degrees and Disciplines (include College/ University)	Additional Qualifications: list related certifications/ licenses; professional experience in field, scholarly contributions, other academic affiliations.
Smith, Heather - Lecturer	N3DG-100 – Design Drawing N3DG-110 – Introduction to 3D Modeling N3DG-115 – Intermediate 3D Modeling N3DG-140 – 3D Lighting and Textures N3DG-210 – Advanced 3D Modeling N3DG-220 – Principles of 4D Design N3DG-225 – 3D Motion	100%	AAS, BS, MFA, Rochester Institute of Technology	Professional experience in field, both in 3D graphics and 3D modeling. Professional experience in the architecture industry.

	N3DG-260 – Professional Practices N3DG-270 – Capstone			
Stoskopf, Kurt* - Associate Professor - Program Director	NAIS-201 – Employment Seminar NAIS-292 – Portfolio Workshop N3DG-100 – Design Drawing N3DG-230 – 3D Printing N3DG-260 – Professional Practices	16.67%	BFA. MFA, Rochester Institute of Technology	Professional experience in field with some work in the 3D printing and modeling industries. Owns and runs a freelance design studio.
Grcevic, Paula - Professor	NAIS-120 – Prin. of Design and Color	12.5%	BFA, MFA, Pratt Institute	Extensive Drawing instructional history. Currently teaches NAIS-120 courses. Exhibiting Fine Artist.

Faculty Member Name and Title/Rank at Institution (include and identify Program Director)	Expected Program Course Assignments*	Percent of Teaching Time to Program	Highest and Other Applicable Earned Degrees and Disciplines (include College/University)	Additional Qualifications: list related certifications/ licenses; professional experience in field, scholarly contributions, other academic affiliations.
Roszkowski, Ernest - Lecturer	NAIS-130 – Raster and Vector Graphics NAIS-292 – Portfolio Workshop	25%	BFA, Rochester Institute of Technology	Currently working towards MFA degree in Computer Graphics Design at RIT.
Zuchegno, Andrea - Assistant Professor	NAIS-130 – Raster and Vector Graphics NAIS-299 – Co-op	16.67%	BS, MS, Rochester Institute of Technology	Currently teaching NAIS-130 courses. Has an additional responsibility as department Co-op coordinator.
Marrer, Nancy - Assistant Professor	NAIS-201 – Employment Seminar	33.33%	BA, Franklin Pierce College; MS, Rochester Institute of Technology	Currently teaching NAIS-201 courses.
Kunsman, Eric - Lecturer	NAIS-201 – Employment Seminar N3DG-230 – 3D Printing	12.25%	BFA, BS, MS, Rochester Institute of Technology; MFA, University of the Arts	Sole proprietor of Booksmart Studio. Experience in publishing and photography.

****Faculty will teach courses as needed. Not all faculty will teach listed courses every semester.**

Table 3: Current Faculty, Part-Time

Provide information on faculty members who are part-time at the institution and who will be teaching each course in the major field or graduate program.

Faculty Member Name and Title/Rank at Institution (include and identify Program Director)	Program Courses which may be Taught	Highest and Other Applicable Earned Degrees and Disciplines (include College/University)	Additional Qualifications: list related certifications/ licenses; professional experience in field, scholarly contributions, other academic affiliations.

Table 4: Faculty to be hired

- If faculty must be hired in the proposed program, specify the title/rank of each new position, the number of new positions, full-time or part-time status, a listing of the expected course assignments for each position, and the expected hiring date.
- Position descriptions and/or announcements may also be submitted.
- Prior to offering the assigned courses, the Department must be notified that a faculty meeting the requirements has been hired.
- These proposed faculty should be reflected in Task 5, Table 5, New Resources

Full-time Faculty

Title/Rank of Position	# of New Positions	Minimum Qualifications (including degree and Discipline area)	Expected course Assignments	Expected Hiring Date (mm/dd/yy)

Part-time Faculty

Title/Rank of Position	# of New Positions	Minimum Qualifications (including degree and Discipline area)	Expected course Assignments	Expected Hiring Date (mm/dd/yy)

4. FINANCIAL RESOURCES AND INSTRUCTIONAL FACILITIES

a. Summarize the instructional facilities and equipment needed to ensure the success of the program including:

1. **Space – Summarize space needs and incremental costs. Please review Division of Academic Affairs Policy and Procedures for Allocation and Utilization of Space and complete Allocation for Space Request Form, Appendix E.**

   In the spirit of the RIT Academic Program Blueprint section IV.a criteria on financial viability, there will be minimal to no incremental costs related to space needs that will be associated with the implementation of the 3D Graphics Technology program. The program will utilize the lab and classroom space available to the Visual Communications Studies department.

   Since the 3D Graphics Technology program will not require new space allocations, and uses the existing Visual Communications Studies departmental labs and classrooms, it is not required to complete the Allocation for Space Request Form.

2. **If this program will share lab or studio space/equipment with other programs, please note that here and provide documentation of agreement in Appendix C.**

   The 3D Graphics Technology program will share the use of computer labs with the Arts and Imaging Studies program within the Visual Communications Studies department's assigned classroom and lab spaces. Please refer to *Appendix C* for the documentation of agreement regarding use of lab/studio space usage from the Visual Communications Studies department.

3. **Equipment (renewal / replacement costs and schedule)**

   The 3D Graphics Technology program will follow the standard NTID 5-year equipment replacement cycle for computers used by faculty and in the classroom computer laboratories.

4. **Computer facilities**

   The 3D Graphics Technology program will follow the standard NTID 5-year equipment replacement cycle for computers used in the classroom laboratories.

5. **Other space and equipment**

   The 3D Graphics Technology program will use the following software in the program: Adobe Creative Cloud software suite, Autodesk Entertainment Creation Suite. The licenses for these software suites are provided to academic

programs for free. There will also be 3D printers used in the program, and shared with the NTID Visual Communication Studies' Design and Imaging Technology program. Expenses for 3D printing supplies and consumables are shown in the cost model, along with 3D rendering workstations and the software required to run the rendering processes.

b. Complete Table 5 after consultation with RIT Finance and Administration and the preparation by them of the new program financial projections in <u>Appendix G</u> (below). These projections include incremental resources needed including personnel (faculty and support personnel [administrative, secretarial, technical, teaching/research assistants]), General Education sections needed, library, equipment, laboratories, supplies and expenses; capital expenditures.

Please refer to page 30 for the completed Table 5 form- New Resources that addresses section IV.c of the Academic Portfolio Blueprint.

Visual Communications Studies Department

3D Graphics Technology Associate of Applied Science Degree Program

Projected Expenditures For The Proposed Program

Table 5 – New Resources

New Expenditures	Year 1	Year 2	Year 3
Personnel			
Library			
Equipment			
Laboratories			
Supplies & Expenses (Other Than Personal Service) **	$ 30,800	$31,700	$46,200
Capital Expenditures			
Other ^	$86,500	$104,000	$134,100
Total all	$117,300	$135,700	$180,300

** The amounts in this row represent RIT computer charges for students/faculty/staff involved in the program, Instructional supplies, telephone charges, software licenses and periodic software upgrades, and travel/conferences for faculty. A breakdown of these expenses may be found on Table 1 – Projected Expenditures for the Proposed Program.

^ The amounts in this row represent tuition payments for RIT credits and overhead (RIT indirect costs). A breakdown of these expenses may be found on Table 1 – Projected Expenditures for the Proposed Program.

5. LIBRARY RESOURCES

a. Summarize the analysis of library resources for this program by the collection librarian and program faculty. Include an assessment of existing library resources and their accessibility to students.

Joan Naturale, the NTID librarian, provided an analysis of library resources in her letter of support that are currently available to students in the 3D Graphics Technology program and is summarized below:

*The library subscribes to **standard core collections** of digital arts and computer graphics **databases, books and journals** by professional associations and publishers for example, ACM Digital Library, Art FullText, Arts and Humanities Full Text, and ARTstor. We subscribe to journals such as ACM (Association of Computing Machinery) Transactions on Graphics, Computer Aided Geometric Design, Computer Arts, Computer Graphics, Computer Graphics Forum, Computer Graphics World, Computers and Graphics, IEEE (Institute of Electrical and Electronic Engineers) Computer Graphics and Applications, Leonardo, and SIGGRAPH Video Review. The library guide created by Kari Horowicz, the Imaging and Arts Librarian supplies links to the books, databases, and journals. http://infoguides.rit.edu/3ddigital*

b. Describe the institution's response to identified needs and its plan for library development.

After review of the 3D Graphics Technology program proposal, Joan Naturale stated in her letter of support, found in *Appendix C*, the following resources the library has that addresses needs for the proposed program and library development plans:

This program will have a minimal impact on the library's services and collection of books, journals, and databases.

RIT Libraries now use a demand/user-driven model of acquisition for the majority of its book purchases ensuring books purchased are those that users want.

The Wallace library's Imaging Arts & Science collection of journals, books and databases, supports the associate degree programs for the technical and artistic aspects of 3D Digital Design.

6. ADMISSIONS AND ENROLLMENT

a. List all program admissions requirements for the proposed program

Undergraduate programs: SAT, ACT, high school GPA, transfer GPA, TOEFL score for international students, special requirements (e.g., portfolio).

The 3DGT program is designed for students who will enter at the Associates of Applied Sciences (AAS) degree level and the admissions criteria shown below reflect the expectations of that level of academic readiness. Scores listed below are the minimum level of readiness for acceptance consideration.

SAT

- 1290 minimum score

ACT

- 18 ACT composite score
- 16 minimum for all Sub-Score areas of ACT
- High school GPA of 3.0

Transfer GPA

- No technical program transfer credit accepted

TOEFL

Test Type	Minimum Score Requirement	
Internet Based TOEFL (iBT)	Combined Reading and Writing score of 40 with neither sub score below 16	For deaf and hard-of-hearing students, the listening section is not included in your total score.
Paper Based TOEFL	550 Total Score	For deaf and hard-of-hearing students, the listening section is not included in your total score. Instead an average of your reading and writing scores are substituted for the listening portion. Reading, writing and the substituted listening score sum is your total.
Computer Based TOEFL	213 Total Score	For deaf and hard-of-hearing students, the listening section is not included in your total score. Instead an average of your reading and writing scores are substituted for the listening portion. Reading, writing and the substituted listening score sum is your total.

Special requirements

- Applicants will be required to submit a portfolio for review as part of their application to the 3D Graphics Technology program. Portfolio submission requirements are as follows:
  - 10-20 portfolio pieces that show applicant's skill in the following subjects:
    - Drawing from observation
    - Evidence of creativity, craftsmanship, and attention to detail shown in original drawings, not from copies
    - Image composition
    - Appropriate use of materials
    - Computer graphics
    - Application essay

Graduate programs: GRE or other exams, college transcripts, undergraduate GPA, recommendations, interview, TOEFL scores, bridge courses, portfolios.

N/A

b. Describe the process for evaluating exceptions to admission requirements

If students are deemed qualified for the 3D Graphics Technology program, while not yet satisfying the admissions requirements, exceptions will be evaluated on a case-by-case basis with preference given to the listed criteria in order:

- Individual portfolio review.
- Prior professional experience evaluated by chair for admission decision, with the understanding that no credit for experience will be granted.
- Application essay review.
- English course placement into UWRT-100 Critical Reading and Writing.

c. How will institution encourage enrollment by persons from groups historically described as underrepresented in the discipline or occupation?

NTID has a college-wide marketing effort, sponsored in part by a grant under the Carl D. Perkins Career and Technical Education Act of 2006, administered by the New York State Education Department. Mailings are sent out to identified groups historically described as underrepresented, and NTID has a website available at www.rit.edu/ntid/options that is available for students, parents, and vocational rehabilitation counselors.

7. ACADEMIC SUPPORT SERVICES

Personal and career counseling as well as academic advising are provided to NTID students for AAS degrees. Upon entry, every associate level NTID supported student is assigned to an NTID counselor/academic advisor who provides both advising and counseling services. This includes the students who are admitted to the 3DGT AAS program. Students who graduate from the AAS in 3DGT and are accepted into the BFA will be assigned an NTID counselor who provides personal and career counseling. The academic advisor in CIAS provides the BFA students' academic advising. The department chair and program coordinator also provide individualized academic advising to associate level students. The expected ratio of advisors to students will range between 90-120 students depending on student needs. Counselor/Advisors also work in collaboration with other service providers on campus to assess student-learning competencies and develop educational interventions where appropriate.

The current professional counselor/advisor list for the Visual Communications Studies department is as follows:

- Bill Moore, Counselor/Academic Advisor Baccalaureate degree level
- Jennifer Geller, Counselor/Academic Advisor Baccalaureate degree level
- Cynthia Boda Lucas, Counselor/Academic Advisor Associates' degree level
- Meg Kangai, Counselor/Academic Advisor Associates' degree level

8. EXTERNAL REVIEW OF GRADUATE PROGRAMS

N/A

9. CREDIT FOR EXPERIENCE

N/A

10. PROGRAM ASSESSMENT AND IMPROVEMENT

a. Please refer to pages 36-39 for the Program Level Outcomes Assessment plan (PLOAP) document. The PLOAP was reviewed by Dr. Anne Wahl, the Assistant Provost for Assessment and Accreditation, and incorporates her feedback in the current version of the document.
b. The items in the PLOAP address section III. j of the Academic Portfolio Blueprint criteria by establishing an evaluation and improvement plan that aligns with the existing RIT guiding documents.

Program Level Outcomes Assessment Plan

Program Name/College: 3D Graphics Technology/ NTID College Contact for Program Assessment: Kurt Stoskopf, Chairperson

Program Goals	Student Learning Outcomes	Academic Program Profile	Data Source/Measure Curriculum Mapping	Benchmark	Timeline	Data Analysis Key Findings	Use of Results Action Items and Dissemination
Please List program-level goals	*Students will be able to: (task, capability, knowledge, skills, and dispositions) Use measurable verbs.*	*Alignment to the five RIT essential outcomes - check all that apply* ☒ *Double click on the check box and find the **Default Value** and click **Checked** to check the box. To uncheck, the box, double click and then click **Not Checked.***	*Assessment opportunity (course/experience) method/measures, assignment/rubric)*	*Standard, target, or achievement level (usually a %) Statement of student Success*	*Identify when and how data are collected, aggregated, and analyzed*	*Identify who is responsible and list key findings*	*Identify how results are used and shared. List any recommendations or action items*
Develop a high degree of technical competence in traditional media drawing and painting, animation, modeling, 3D printing, and computer-based skills in 2D and 3D graphics software.	Use appropriate software applications and hardware systems in the design and production of 3D graphics projects.	☒ Critical Thinking ☐ Ethical Reasoning ☐ Integrative Literacies ☐ Global Interconnectedness ☒ Creative/Innovative Thinking	**N3DG-270 Capstone** Capstone Project Capstone project assessment rubric **NAIS-292 Portfolio Workshop** Portfolio quality assessment rubric.	Minimum 80% of students will receive a rubric rating of "satisfactory" or "meets professional expectations" .	Data collected in each section of NAIS-292, N3DG-270.	Course faculty will collect data. Program chairperson and program coordinator will analyze the data.	Department faculty and counselors/academic advisors will review analysis and recommend appropriate actions. Distribute data in the NTID Summary Report, the NTID Annual Report, and RIT Progress reports, as needed.
Develop the essential skills necessary for entry-level employment in the 3D graphics industry.	Demonstrate effective writing and presenting skills for career preparation	☒ Critical Thinking ☐ Ethical Reasoning ☒ Integrative Literacies ☐ Global Interconnectedness ☒ Creative/Innovative Thinking	**NAIS-201 Employment Seminar** Cover letter, resume, and interview assessment rubric.	Minimum 80% of students will receive a rubric rating of "satisfactory" or "meets	Data collected in each section of NAIS-201.	Course faculty will collect data. Program chairperson and program coordinator will analyze data.	Department faculty and employment advisors and counselors/academic advisors will review analysis and recommend appropriate actions.

				professional expectations” .			Distribute data in the NTID Summary Report, the NTID Annual Report, and any RIT reports, as needed.
	Demonstrate technical skills and preparation for 3D graphics job market.		**NAIS-299 Co-op** Co-op Employer’s Evaluation, question #29 (student’s overall performance)	80% of students will receive a score of “3” or higher (5-point scale)	Supervisor evaluations are collected at the end of each completed co-op work experience.	NCE will compile co-op supervisor evaluation data. Program chairperson and program coordinator will analyze the data.	
			Question #30, “Competitive for the job market.	Minimum 80% of students will receive a “Yes” response			
			NAIS-292 Portfolio Workshop Portfolio quality assessment rubric.	Minimum 80% of students will receive a rubric rating of “satisfactory” or “meets professional expectations” .	Data collected in each section of NAIS-292.	Course faculty will collect data. Program chairperson and program coordinator will analyze the data.	
			NTID Center on Employment (NCE) Graduate Employment Report.	80% of graduates seeking employment will be employed in the 3D	Data collected annually one year post-graduation.	NCE will compile graduate employment data.	

				graphics industry.			
Demonstrate effective project management and teamwork skills	Manage projects from theoretical concept to final product on time, on budget, and in compliance with industry standards and sustainability guidelines.	☒ Critical Thinking ☒ Ethical Reasoning ☐ Integrative Literacies ☐ Global Interconnectedness ☒ Creative/Innovative Thinking	**NAIS-292 Portfolio Workshop Portfolio** Portfolio quality assessment rubric. **N3DG-270 Capstone** Capstone project assessment rubric.	Minimum 80% of students will receive a rubric rating of "satisfactory" or "meets professional expectations".	Data collected in each section of N3DG-270 and NAIS-292 each semester.	Faculty will collect data at conclusion of each semester. Faculty committee will analyze the data.	Department faculty will review and discuss analysis and recommend appropriate actions. Distribute data in the NTID Summary Report, the NTID Annual Report, and RIT Progress reports, as needed.
Develop effective communication, collaboration, and interpersonal skills.	Work collaboratively in multidisciplinary teams, formulating and responding to constructive team and individual feedback. Communicate effectively with peers, design and production professionals, and clients using design and production concepts	☒ Critical Thinking ☒ Ethical Reasoning ☐ Integrative Literacies ☐ Global Interconnectedness ☐ Creative/Innovative Thinking	**N3DG-270 Capstone** Capstone project assessment rubric. **N3DG-260 Professional Practices** Design Planning and Presentation project Interpersonal/ soft skills assessment rubric. Communication skills rubric.	Minimum 80% of students will receive a rubric rating of "satisfactory" or "meets professional expectations".	Data collected in each section of N3DG-270 and N3DG-260 each semester.	Course faculty will collect data. Program chairperson and program coordinator will analyze the data	Department faculty and counselors/academic advisors will review analysis and recommend appropriate actions. Distribute data in the NTID Summary Report, the NTID Annual Report, and RIT Progress reports, as needed.

	Demonstrate appropriate writing skills and use of technical vocabulary.		**N3DG-270 Capstone** Capstone project assessment rubric.				
Demonstrate the creative and technical skills required to create 3D graphics, 3D printouts, environmental visualization graphics, and building 3D models used in multimedia and animation.	Exhibit individual competence in 3D Graphics and production of professional quality 3D media.	☒ Critical Thinking ☐ Ethical Reasoning ☐ Integrative Literacies ☐ Global Interconnectedness ☒ Creative/Innovative Thinking	**N3DG-270 Capstone** Capstone project assessment rubric. **NAIS-292 Portfolio Workshop** Assemble and maintain a collection of completed work that shows technical competence and the qualities needed to effectively compete in the student's chosen career in the 3D graphics industry. NAIS-292 Portfolio quality assessment rubric.	Minimum 80% of students will receive a rubric rating of "satisfactory" or "meets professional expectations" .	Data collected in each section of N3DG-270 and N3DG-292 each semester.	Course faculty will collect data. Program chairperson and program coordinator will analyze the data	Department faculty will review and discuss analysis and recommend appropriate actions. Distribute data in the NTID Summary Report, the NTID Annual Report, and RIT Progress reports, as needed.

Demonstrate the knowledge and skills necessary to function in a global society.	Describe the interrelatedness of social, cultural, and visual communication factors that shape and impact the global 3D graphics industry and marketplace.	☐ Critical Thinking ☒ Ethical Reasoning ☐ Integrative Literacies ☒ Global Interconnectedness ☐ Creative/Innovative Thinking	**N3DG-260 Professional Practices** Workplace Ethics project Business ethics assessment rubric.	Minimum 80% of students will receive a rubric rating of "satisfactory" or "meets professional expectations" .	Data collected in each section of N3DG-260 each semester.	Course faculty will collect data. Program chairperson and program coordinator will analyze the data	Department faculty, program chairperson, and program coordinator will review analysis and recommend appropriate actions. Distribute data in the NTID Summary Report, the NTID Annual Report, and RIT Progress reports, as needed.

c. Accreditation and Program Review

1. **List any external organizations (excepting NYSED and Middle States) that will evaluate/acc society)**

   National Association of Schools of Art and Design (NASAD)

2. **How frequently will the accreditation evaluation occur?**

   Accreditation evaluations for NASAD take place every 10 years.

3. **Indicate how the program has been designed to meet the criteria of that accrediting agency by pro accrediting agency with those of the program.**

   NASAD has established standards for Two-year vocational programs that the NTID Visual Communications Studies department adheres to, as required by the NASAD accreditation for both NTID and CIAS at RIT. The requirements for NASAD are listed below, excerpted from the NASAD Handbook, pages 90-91, with commentary added describing how the program meets those requirements.

Excerpted From NASAD Handbook, Section VI.B. Standards for Two-Year Vocational Programs

I. General Standards. *The awarding of a diploma for a two-year vocational degree implies the successful completion of a prescribed course of study oriented to the achievement of specific results.*

All such programs must meet applicable standards for purposes and operations (Section II). In addition:

a. A specific coherent set of purposes shall be developed and published that include, but are not limited to:

(1) Title or basic identification of the subject matter, techniques, or issues to be addressed.

(2) Specific content, methods, and perspectives used to consider subject matter, techniques, or issues, including expectations regarding:

(a) Artistic, intellectual, or disciplinary engagement; and

(b) Breadth and depth in disciplinary components.

The 3DGT program proposal addresses these items in the program proposal.

b. Operational assessments shall reveal consistent achievement of goals and objectives.

The Program Level Outcomes Assessment Plan (PLOAP) in Section 10, pages 36-40 of this document provides the framework of operational assessment and reporting mechanisms for evaluating achievement of goals and objectives.

c. *Degree titles shall be consistent with content. Published materials shall be clear about the level and length of any degree program.*

The 3D Graphics Technology program, once approval is granted, will publish materials in the RIT Undergraduate Catalog that list it as an AAS degree, and will be clear that the program is a 5 semester associates' degree program.

d. *Applicable prerequisites for courses or curricula shall be clearly stated, especially with regard to levels of competence in specific disciplines central to the artistic or educational purposes and content of the degree.*

The course outlines and course descriptions, found in *Appendix A- New or Revised Course Outline Forms*, state clearly the prerequisites required for courses in the 3DGT program,

e. *Guidance, counseling, and mentoring shall be adequate to support the achievement of purposes.*

Section 7- Academic Support Services of the 3DGT program proposal outlines the guidance, counseling, and mentoring services that are available to support students.

f. *There must be clear descriptions of what students are expected to know and be able to do upon completion and effective mechanisms for assessing student competencies against these expectations, consistent with Section VI.B.1.a.*

The course outlines found in in *Appendix A- New or Revised Course Outline Forms*, in section 3.0 *Goals of the Course*, and section 7.0 *Intended learning outcomes and associated methods of those outcomes*, provide descriptions of what students are expected to know and able to do upon completion of the courses in the 3DGT program.

g. *Evaluation mechanisms shall be consistent with the goals defined for specific courses, projects, programs, or curricula, and to the specific approach (es) involved.*

The course outlines found in in *Appendix A- New or Revised Course Outline Forms*, in section 7.0 *intended learning outcomes and associated methods of those outcomes,* provide the basis for the evaluation mechanisms for the courses, as well as the specific approaches used for evaluation.

h. *The institution and art/design unit shall maintain and publish clear, valid information about any vocational connections or career or job placement agreements claimed by the institution.*

The program description in Section 1, item a. published in the RIT Undergraduate Bulletin provides information about vocational connections, as well as educational connections.

II. Program Standards. *A review of each two-year vocational degree program must demonstrate that:*

a. Students are achieving a measurable degree of advancement toward fulfillment of specified and stated program purposes, including technical mastery in at least one of the traditional or innovative techniques appropriate to their craft or field of study.

b. Students are developing an effective work process and a coherent set of ideas and goals that are embodied in their work.

c. Students are developing a significant body of skills, sufficient for evaluation, and a level of artistry and/or technical proficiency and/or analytical competence observable in work sufficient to enter the vocational field at the level indicated by program purposes.

d. Institutional performance with respect to operational and general curricular standards in Sections II. and III. supports achievements of the general and program standards of Sections VI.A.1. and 2.

To attain these objectives, it is assumed that work at the introductory/foundation level will be followed by increasingly advanced work.

In addressing the NASAD Program Standards, section II, items a through d, the Program Level Outcomes Assessment Plan (PLOAP) in Section 10, pages 36-39 of this document, along with Section 1, items b.1 through 6 of this document will indicate 3DGT program compliance with the listed standards, along with listed evaluation methodologies.

4. Indicate plan for ongoing and formal periodic program review

The 3DGT program will undergo ongoing and formal periodic program review by NASAD every ten years, along with the Arts and Imaging Studies program in the Visual Communications Studies department of NTID, and the programs and schools of the College of Imaging Arts and Sciences.

11. NEW/EMERGING FIELD AND ALLIED HEALTH AREAS

N/A

12. TRANSFER TO BACCALAUREATE PROGRAMS

If the program will be promoted as preparing students for transfer to a baccalaureate program, provide a copy of an articulation agreement with at least one institution.

Please refer to pages 44-49 for the transfer articulation agreement document that outlines the agreement between the 3DGT AAS program and the CIAS 3D Digital Design BFA program. Of particular note, this is the first transfer articulation agreement established between the colleges of NTID and CIAS.

Transfer Articulation Agreement
Between the College of Imaging Arts and Sciences
BFA in 3D Digital Design Degree Program
And the National Technical Institute for the Deaf
AAS in 3D Graphics Technology Program

Purpose

This articulation agreement is established between the NTID 3D Graphics Technology program (N3DG) and the 3D Digital Design program (3DDD) in the College of Imaging Arts and Sciences to assist in facilitating timely student progress from the AAS degree level to the BFA degree level. The NTID 3D Graphics Technology program and the 3D Digital Design program have a common linkage by nature of the subjects taught in both programs, and this document will support student quality in both programs by ensuring consistency for expectations of levels of student knowledge and skill.

Student Qualifications for Transfer from the 3D Graphics Technology AAS program to the 3D Digital Design BFA program

Qualified students will:

- Be a graduate of the NTID 3D Graphics Technology AAS Program.
- Prepare a satisfactory demo reel or portfolio of still images for review by the 3D Digital Design program chairperson, or authorized representative(s). The review of the demo reel or portfolio will determine students' acceptance status and contribute to the determination of year-level placement in the 3D Digital Design program. Decisions made in placing students at either the second-year or third-year level, will be made with the review of the demo reel, along with the following grade point average requirements:
    - Earned a cumulative grade point average of 3.00 or above on a 4.00 scale for consideration towards admission at the third year level of the 3D Digital Design program.
    - Earned a cumulative grade point average of 2.667 or above on a 4.00 scale for consideration towards admission at the second year level of the 3D Digital Design program.
- Obtain a letter of support from the NTID 3D Digital Design support faculty.
- Be a student in good standing at the National Technical Institute for the Deaf.

Terms of the Agreement

I. Admissions process

a. The process for admission to the 3D Digital Design BFA program can begin as early as the students' fourth term in the 3D Graphics Technology program (the spring of the students' second year).

b. The steps in the process will be:

i. Student indicates his/her interest to the NTID 3D Digital Design support faculty and the Visual Communications Studies Chairperson.

ii. Review will be made of student's academic qualifications based on items listed in the *"Student Qualifications for Transfer from the 3D Graphics Technology AAS program to the 3D Digital Design BFA program"* listed above. A letter of support will be written for the student.

iii. If student meets the qualifications listed, then the student will submit the following items to the chairperson of the 3D Digital Design department:

- Demo reel or portfolio of still pieces
- Transcript
- Letter of support from the NTID 3D Digital Design support faculty
- RIT Intent to Enroll form

iv. Upon receipt of the application materials listed above, the 3D Digital Design chairperson, or appointed 3D Digital Design faculty reviewer, will evaluate the materials and will share the review and acceptance decision recommendation with the 3D Digital Design chairperson.

v. The 3D Digital Design chairperson will inform student and NTID 3D Digital Design support faculty of acceptance decision.

II. Year Level

a. Students who transfer from the 3D Graphics Technology AAS program will do so at either the second-year or the third-year level in the 3D Digital Design BFA program, with the placement decision being made based on the requirements listed in the *"Student Qualifications for Transfer from the 3D Graphics Technology AAS program to the 3D Digital Design BFA program"* section above. .

III. Program and Course changes

a. The 3D Graphics Technology program and the 3D Digital Design program will communicate any changes to their respective curricula and make any changes to the articulation document to ensure continuation of the articulation agreement.

IV. Time limits

a. This agreement will be formally reviewed every three years from the date of signing, or at the time of any major curriculum change.

V. Autonomy

a. The 3D Digital Design BFA program will be free to admit qualified non-matriculated, NTID-supported students who apply to the program through the normal RIT freshman admissions process. If students are deemed "underprepared" then a recommendation should be made to NTID for admissions opportunities.

R·I·T

Rochester Institute of Technology

National Technical Institute for the Deaf
Visual Communications Studies Dept.
52 Lomb Memorial Drive
Rochester, NY 14623-5603
http://www.ntid.rit.edu/vcs

Approvals

Approved by representatives of the College of Imaging Arts and Sciences:

Marla Schweppe
Program Chair
3D Digital Design

Peter Byrne
Administrative Chair
School of Design

Lorraine Justice
Dean

Approved by representatives of the National Technical Institute for the Deaf:

Ken Hoffmann
Chairperson
Visual Communication Studies

Stephen Aldersley
Associate Vice President for Academic Affairs

Gerard Buckley
President, NTID
Vice President and Dean, RIT

NTID VCS 3DGT to CIAS DDDD credit transfer guide and checklist

The transfer articulation agreement between VCS and DDDD specify students who apply and are accepted into the DDDD program after graduation from the VCS 3DGT program will be accepted at either the second or third year level depending on GPA and Demo Reel evaluation.

The guidelines state that students with a 3.0 or higher GPA and a strong demo reel will enter the DDDD program at the third year level, and students with a 2.667 or higher GPA and a strong demo reel will enter at the second year level.

- **Third year students should enter with 66 credits transferred from 3DGT.**
- **Second year students should enter with 41 credits transferred from 3DGT.**

Program course equivalencies between 3DGT and DDDD are listed below:

3DGT course	DDDD Equivalent course	Credit	Grade	Transfer (check if transferred)	Notes
NAIS-120 Principles of Design and Color	**FDTN-121** 2D Design 1	3			
NAIS-130 Raster and Vector Graphics	**DDDD Free Elective**	3			
NAIS-292 Portfolio Workshop	**DDDD Free Elective**	3			
N3DG-100 Design Drawing	**DDDD-103** Imaging for 3D	3			
N3DG-110 Basic 3D Modeling	**DDDD-101** Introduction to Modeling and Motion	3			
N3DG-115 Intermediate 3D Modeling	**DDDD-102** Introduction to Visual Design	3			
N3DG-140 3D Lighting and Materials	**DDDD-207** Lighting, Materials and Rendering	3			
N3DG-210 Advanced 3D Modeling	**DDDD-201** Modeling Strategies	3			
N3DG-220 Principles of 4D Design	**FDTN-141** 4D Design	3			
N3DG-225 3D Motion	**DDDD-202** Layers and Effects	3			
N3DG-230 3D Printing	**3DDG Major Elective**	3			

N3DG-260 Professional Practices	**DDDD-301** Professional Practice	3			
N3DG-270 Capstone	**DDDD-206** Service Project	3			
NGRD or NGRP Elective #1	**DDDD Free Elective**	3			
NGRD or NGRP Elective #2	**DDDD Free Elective**	3			
General Education courses that will transfer towards BFA degree requirements					
First Year LAS Elective		3			
First Year Writing		3			
LAS Perspective 1		3			
LAS Perspective 2 (ARTH-135 Survey of Western Art and Architecture I)		3			
LAS Perspective 3 (ARTH-136 Survey of Western Art and Architecture II)		3			
LAS Perspectives 4		3			
LAS Perspective 5, 6 or 7 (SMTL): NMTH-250 or above*		3			
Wellness Education		0			
Total Credits transferred			**66** credits with **3.0** GPA and Demo Reel **41** credits with **2.667** GPA and Demo Reel		

Student name: _____

Reviewer: _____ Date: _____

*AAS degree requires NMTH-120 but if the student takes NMTH-250 or above, the course can transfer to BFA degree to satisfy the LAS Elective Science, Math, Technical Literacy (SMTL) requirement.

13. APPLICATION FOR DISTANCE EDUCATION

N/A

Appendix A

New or Revised Course Outline Forms

N3DG-100	Design Drawing
N3DG-110	Basic 3D Modeling
N3DG-115	Intermediate 3D Modeling and Techniques
N3DG-140	3D Lighting and Materials
N3DG-210	Advanced 3D Modeling and Techniques
N3DG-220	Principles of 4D Design
N3DG-225	3D Motion
N3DG-230	3D Printing
N3DG-260	Professional Practices
N3DG-270	Capstone

ROCHESTER INSTITUTE OF TECHNOLOGY
COURSE PROPOSAL FORM

National Technical Institute for the Deaf

Visual Communications Studies Department

NEW (or REVISED) COURSE
NTID-N3DG-100 Design Drawing

1.0 Course Designations and Approvals

Required course approvals:	**Approval request date:**	**Approval granted date:**
Academic Unit Curriculum Committee	10/21/14	10/21/14
College Curriculum Committee	1/30/15	4/2/15

Optional designations:	**Is designation desired?**		***Approval request date:**	****Approval granted date:**
General Education:		No		
Writing Intensive:		No		
Honors		No		

2.0 Course information:

Course title:	**Design Drawing**
Credit hours:	3
Prerequisite(s):	N/A
Co-requisite(s):	N/A
Course proposed by:	Heather L. Smith
Effective date:	Academic Year 2016-17

	Contact hours	**Maximum students/section**
Classroom	2	10
Lab	3	10
Studio		
Other (specify)		

2.a Semester(s) offered (check)

Fall x	Spring	Summer	Other

All courses must be offered at least once a year. If course will be offered on a bi-annual basis, please indicate here:

2.b Student Requirements

Students required to take this course: (by program and year, as appropriate) 1st year 3DGT Students
Students who might elect to take the course: Other students by VCS departmental approval

In the sections that follow, please use sub-numbering as appropriate (e.g. 3.1, 3.2, etc.)

3.0 Goals of the course (including rationale for the course, when appropriate):

3.1 Develop reading, writing, analytical thinking, and problem solving skills related to design drawing, perspective techniques and orthographic projections.
3.2 Learn the concepts of basic design drawing using three-dimensional space.
3.3 Understand basic elements of 3D, form and space, proportion and scale.
3.4 Understand the fundamentals of color theory.
3.5 Understand the concepts of basic composition and visualization techniques.
3.6 Develop team and individual approaches to workflow, problem-solving and critique methods.
3.7 Develop presentation skills.

4.0 Course description (as it will appear in the RIT Catalog, including pre- and co-requisites, and semesters offered). Please use the following format:

Course number: Name of Course Description, as you want it to appear in the catalog. (Pre or co-requisites) **Class X, Lab X, Credit X (Semester offered)**

N3DG-100 Design Drawing:
This course is an introduction to the fundamentals of drawing objects depicting three-dimensional space using traditional and computer-based techniques. Students will create drawings by observation of the world and use of invented or nonobjective forms, creating surface textures, and designing and laying out compositions. Color theory will be introduced and used in the course. Students will also use and understand the basics of perspective, perspective grids, and creating and using mechanical perspective and orthogonal projections of objects.
Class 2, Lab 3, Credit 3 (F)

5.0 Possible resources (texts, references, computer packages, etc.)

5.1 3D Software, Image Manipulation Software
5.2 Tutorials and reference materials
5.3 Online tutorials
5.4 Articles, handouts, examples provided by the instructor

6.0 Topics (outline):

6.1 Visual and verbal vocabulary for elements of design drawing in 3D graphics
6.2 Introduction to Perspective
  6.2.1 Types of Perspective: 1-point, 2-point, and 3-point
6.3 Introduction to Orthographic Projection
  6.3.1 Plane Views
  6.3.2 Section Views
  6.3.3 Elevation Views
6.4 Basic Elements of Design
  6.4.1 Point, Line, Plane, and Volume
  6.4.2 Form and Space
6.5 Proportion & Scale
  6.5.1 Mechanical Scale and Visual Scale
6.6 Introduction to Color Theory
  6.6.1 Primary, Secondary, Intermediate and Tertiary
  6.6.2 Introduction to RGB (Red, Green, Blue), HSL (hue-saturation-lightness) and HSV (hue-saturation-value)
6.7 Rendering Techniques
  6.7.1 Lighting
  6.7.2 Shades/Shadows
  6.7.3 Highlights/Reflections
6.8 Composition / Visualization Techniques

7.0 Intended course learning outcomes and associated assessment methods of those outcomes (please include as many Course Learning Outcomes as appropriate, one outcome and assessment method per row).

Course Learning Outcome	Assessment Method
7.1 Apply the basic techniques for perspective and orthographical projections. (3.1)	Successful completion of projects.
7.2 Differentiate the basic concepts of three-dimensional spaces using traditional and computer-based techniques. (3.2)	Successful completion of quizzes, or projects.
7.3 Create the basic elements of design using form and space, proportion and scale in the compositions. (3.3)	Successful completion of projects.
7.4 Define and utilize the fundamentals of color theory. (3.4)	Successful completion of written assignments or quizzes.
7.5 Design a basic composition or visualization using traditional and 3D software. (3.5)	Successful completion of projects.
7.6 Work successfully as part of a team to solve design problems and to accept and offer positive critique methods. (3.6)	Successful demonstration of team problem solving and critiquing methods.
7.7 Demonstrate presentation skills, including creation and organization of demo reel/portfolio. (3.7)	Successful demonstration of presentation skills.

8.0 Program outcomes and/or goals supported by this course

8.1 Develop a high degree of technical competence in traditional media drawing and painting, as well as in animation, modeling, 3D printing, and computer-based skills in 2D and 3D graphics software. 8.2 Demonstrate the creative and technical skills required to create 3D graphics, 3D printouts, architectural visualization graphics, and building 3D models used in multimedia and animation. 8.3 Demonstrate skills related to project management and teamwork. 8.4 Develop effective communication, collaboration, and interpersonal skills.

9.0 N/A

	General Education Learning Outcome Supported by the Course, if appropriate	**Assessment Method**
Communication		
	Express oneself effectively in common college-level written forms using standard American English	
	Revise and improve written products	
	Express oneself effectively in presentations, either in spoken standard American English or sign language (American Sign Language or English-based Signing)	
	Comprehend information accessed through reading and discussion	
Intellectual Inquiry		
	Review, assess, and draw conclusions about hypotheses and theories	
	Analyze arguments, in relation to their premises, assumptions, contexts, and conclusions	
	Construct logical and reasonable arguments that include anticipation of counterarguments	
	Use relevant evidence gathered through accepted scholarly methods and properly acknowledge sources of information	
Ethical, Social and Global Awareness		
	Analyze similarities and differences in human experiences and consequent perspectives	
	Examine connections among the world's populations	
	Identify contemporary ethical questions and relevant stakeholder positions	
Scientific, Mathematical and Technological Literacy		
	Demonstrate knowledge of basic principles and concepts of one of the natural sciences	
	Apply methods of scientific inquiry and problem solving to contemporary issues	
	Comprehend and evaluate mathematical and statistical information	

	Perform college-level mathematical operations or apply statistical techniques	
	Describe the potential and the limitations of technology	
	Use appropriate technology to achieve desired outcomes	
Creativity, Innovation and Artistic Literacy		
	Demonstrate creative/innovative approaches to course-based assignments or projects	
	Interpret and evaluate artistic expression considering the cultural context in which it was created	

10.0 Other relevant information (such as special classroom, studio, or lab needs, Special scheduling, media requirements, etc.)

10.1 Classroom needs student workstation computers equipped with high-end 3D software and other support software, as appropriate.
10.2 Instructor station needs same software and hardware as student workstations and a projection system with sound.

***Optional course designation; approval request date:** This is the date that the college curriculum committee forwards this course to the appropriate optional course designation curriculum committee for review. The chair of the college curriculum committee is responsible to fill in this date.

****Optional course designation; approval granted date:** This is the date the optional course designation curriculum committee approves a course for the requested optional course designation. The chair of the appropriate optional course designation curriculum committee is responsible to fill in this date.

ROCHESTER INSTITUTE OF TECHNOLOGY
COURSE PROPOSAL FORM

National Technical Institute for the Deaf

Visual Communications Studies Department

NEW (or REVISED) COURSE
NTID-N3DG-110 Basic 3D Modeling

1.0 Course Designations and Approvals

Required course approvals:	**Approval request date:**	**Approval granted date:**
Academic Unit Curriculum Committee	10-21-2014	10-21-2014
College Curriculum Committee	1/30/15	4/2/15

Optional designations:	**Is designation desired?**		***Approval request date:**	****Approval granted date:**
General Education:		No		
Writing Intensive:		No		
Honors		No		

2.0 Course information:

Course title:	**Basic 3D Modeling**
Credit hours:	3
Prerequisite(s):	N/A
Co-requisite(s):	N/A
Course proposed by:	Heather L. Smith
Effective date:	Academic Year 2016-17

	Contact hours	**Maximum students/section**
Classroom	2	10
Lab	3	10
Studio		
Other (specify)		

2.a Semester(s) offered (check)

Fall x	Spring	Summer	Other

All courses must be offered at least once every year. If course will be offered on a bi- annual basis, please indicate here:

2.b Student Requirements

Students required to take this course: (by program and year, as appropriate) 1st year 3DGT Students
Students who might elect to take the course: Other students by VCS departmental approval

In the sections that follow, please use sub-numbering as appropriate (e.g. 3.1, 3.2, etc.)

3.0 Goals of the course (including rationale for the course, when appropriate):

3.1 Develop reading, writing, analytical thinking, and problem solving skills related to 3D.
3.2 Develop a solid foundation in visual elements and principles of design related to 3D.
3.3 Learn and understand the process of workflow and research.
3.4 Learn and develop skills to create 3D models using 3D software.
3.5 Learn modeling techniques.
3.6 Understand concepts related to basic surfaces and lighting.
3.7 Learn about basic composition in 3D space.
3.8 Learn and understand rendering methodologies.
3.9 Learn about file references.
3.10 Develop team and individual approaches for problem solving and critiquing.
3.11 Prepare projects for inclusion in the portfolio.

4.0 Course description (as it will appear in the RIT Catalog, including pre- and co-requisites, and semesters offered). Please use the following format:

Course number: Name of Course
Description as you want it to appear in the catalog. (Pre or co-requisites)
Class X, Lab X, Credit X (Semester offered)

N3DG-110 Basic 3D Modeling:
This course is an introduction to the representation of form in three-dimensional space using 3D software. The course focuses on the development of visual and verbal vocabulary as a means of exploring, developing, and understanding 3D modeling techniques. Topics include the basics of lines, planes, contour, transforming lines into forms, interaction of lights and surfaces, perspective, resolution of geometry, and rendering. Projects will include modeling organic and inorganic forms, composition and level of detail. Structured assignments develop skills in concept generation, basic form making, techniques and craftsmanship. Emphasis is placed on workflow, teamwork, and the technical and aesthetic aspects of each project.
Class 2, Lab 3, Credit 3 (F)

5.0 Possible resources (texts, references, computer packages, etc.)

5.1 Image Manipulation Program, 3D Software, Video Software
5.2 Textbook
5.3 Software tutorials and reference materials
5.4 DVDs and online tutorials
5.6 Articles, handouts, and examples provided by the instructor

6.0 Topics (outline):

6.1 Visual and verbal vocabulary of design in 3D graphics
  6.1.1. Basic information about three-dimensional space
  6.1.2. Overview of visual elements and principles of three-dimensional modeling
  6.1.3. Research and Project Planning for 3D modeling
6.2 Introduction of 3D Software
6.3 Types of models to create organic/inorganic forms
  6.3.1 Polygons
  6.3.2 NURBS
  6.3.3 Subdivisions
6.4 Introduction to basic material types
6.5 Introduction to basic lightings
6.6 Introduction to basic rendering techniques with its basic compositions
6.7 Introduction to file references within 3D software.
6.8 Introduction to demo-reel.

7.0 Intended course learning outcomes and associated assessment methods of those outcomes (please include as many Course Learning Outcomes as appropriate, one outcome and assessment method per row).

Course Learning Outcome	Assessment Method
7.1 Distinguish the visual elements and principles of design related to 3D. (3.1, 3.2)	Successful completion of written assignments or quizzes.
7.2 Demonstrate an understanding the process of workflow and how to research to create and develop 3D models. (3.2, 3.3)	Successful completion of written assignments or quizzes.
7.3 Apply 3D techniques using Polygons, NURBS, and Subdivision's using 3D software. (3.4, 3.5)	Successful completion of projects.
7.4 Recognize the different types of lighting and basic surface and apply on 3D models. (3.6)	Successful completion of projects.
7.5 Develop and design basic composition using 3D software. (3.7)	Successful completion of projects.
7.6 Identify and compute the rendering settings to render final images. (3.8) (3.11)	Successful completion of projects.
7.7 Generalize and examine the industry's standards file structures and references using 3D software. (3.9)	Successful completion of written assignments.

7.8 Work as part of a team to solve design problems and to accept and offer feedback. (3.10)	Successful demonstration of team problem solving and critique

8.0 Program outcomes and/or goals supported by this course

8.1 Develop a high degree of technical competence in traditional media drawing and painting, as well as in animation, modeling, 3D printing, and computer-based skills in 2D and 3D graphics software.
8.2 Demonstrate the creative and technical skills required to create 3D graphics, 3D printouts, architectural visualization graphics, and building 3D models used in multimedia and animation.
8.3 Demonstrate effective project management and teamwork skills.
8.4 Develop effective communication, collaboration, and interpersonal skills.

9.0 N/A

	General Education Learning Outcome Supported by the Course, if appropriate	**Assessment Method**
Communication		
	Express oneself effectively in common college-level written forms using standard American English	
	Revise and improve written products	
	Express oneself effectively in presentations, either in spoken standard American English or sign language (American Sign Language or English-based Signing)	
	Comprehend information accessed through reading and discussion	
Intellectual Inquiry		
	Review, assess, and draw conclusions about hypotheses and theories	
	Analyze arguments, in relation to their premises, assumptions, contexts, and conclusions	
	Construct logical and reasonable arguments that include anticipation of counterarguments	
	Use relevant evidence gathered through accepted scholarly methods and properly acknowledge sources of information	
Ethical, Social and Global Awareness		
	Analyze similarities and differences in human experiences and consequent perspectives	
	Examine connections among the world's populations	
	Identify contemporary ethical questions and relevant stakeholder positions	

Scientific, Mathematical and Technological Literacy		
	Demonstrate knowledge of basic principles and concepts of one of the natural sciences	
	Apply methods of scientific inquiry and problem solving to contemporary issues	
	Comprehend and evaluate mathematical and statistical information	
	Perform college-level mathematical operations or apply statistical techniques	
	Describe the potential and the limitations of technology	
	Use appropriate technology to achieve desired outcomes	
Creativity, Innovation and Artistic Literacy		
	Demonstrate creative/innovative approaches to course-based assignments or projects	
	Interpret and evaluate artistic expression considering the cultural context in which it was created	

10.0 Other relevant information (such as special classroom, studio, or lab needs, Special scheduling, media requirements, etc.)

10.1 Classroom needs student workstation computers equipped with high-end 3D software and other support software, as appropriate.

10.2 Instructor station needs same software and hardware as student workstations and a projection system with sound.

***Optional course designation; approval request date:** This is the date that the college curriculum committee forwards this course to the appropriate optional course designation curriculum committee for review. The chair of the college curriculum committee is responsible to fill in this date.

****Optional course designation; approval granted date:** This is the date the optional course designation curriculum committee approves a course for the requested optional course designation. The chair of the appropriate optional course designation curriculum committee is responsible to fill in this date.

ROCHESTER INSTITUTE OF TECHNOLOGY
COURSE PROPOSAL FORM

National Technical Institute for the Deaf

Visual Communications Studies Department

NEW COURSE
NTID-N3DG-115 Intermediate 3D Modeling and Techniques

1.0 Course Designations and Approvals

Required course approvals:	**Approval request date:**	**Approval granted date:**
Academic Unit Curriculum Committee	10/21/14	10/21/14
College Curriculum Committee	1/30/15	4/2/15

Optional designations:	**Is designation desired?**		***Approval request date:**	****Approval granted date:**
General Education:		No		
Writing Intensive:		No		
Honors		No		

2.0 Course information:

Course title:	**Intermediate 3D Modeling and Techniques**
Credit hours:	3
Prerequisite(s):	N3DG-100 Design Drawing, N3DG-110 Basic 3D Modeling
Co-requisite(s):	
Course proposed by:	Heather L. Smith
Effective date:	Academic Year 2016-17

	Contact hours	**Maximum students/section**
Classroom	2	10
Lab	3	10
Studio		
Other (specify)		

2.a Semester(s) offered (check)

Fall	Spring x	Summer	Other

All courses must be offered at least once a year. If course will be offered on a bi-annual basis, please indicate here:

2.b Student Requirements

Students required to take this course: (by program and year, as appropriate) 1st year 3DGT Students
Students who might elect to take the course: Other students by VCS departmental approval

In the sections that follow, please use sub-numbering as appropriate (e.g. 3.1, 3.2, etc.)

3.0 Goals of the course (including rationale for the course, when appropriate):

3.1 Develop reading, writing, analytical thinking, and problem solving skills related to 3D modeling and production pipelines.
3.2 Enhance ability to identify objects for use in creating complex models.
3.3 Develop ability to select appropriate modeling tools, techniques and solutions for 3D graphics.
3.4 Learn to apply composition and visualization techniques using 3D software.
3.5 Introduce scripting for 3D graphics.
3.6 Learn to manage scenes, files and projects within 3D software.
3.7 Learn to apply art and layout techniques.
3.8 Develop team and individual approaches in workflow, problem-solving and critiquing.
3.9 Gain knowledge about career opportunities in the area of 3D Graphics.
3.10 Develop presentation skills.

4.0 Course description (as it will appear in the RIT Catalog, including pre- and co-requisites, and semesters offered). Please use the following format:

Course number: Name of Course Description as you want it to appear in the catalog. (Pre or co-requisites) **Class X, Lab X, Credit X (Semester offered)**

N3DG-115 Intermediate 3D Modeling & Techniques
This course will provide students with an extensive range of strategies for modeling and evaluation of the appropriate methods to use in various 3D design situations. The emphasis on the course will be on researching and problem solving in the areas of environments, interiors, spaces, objects and characters. With these techniques, students will develop intermediate skills in creating complex models of organic and inorganic forms, composition, concept art layout, and level of details. Emphasis is placed on workflow, teamwork, and technical and aesthetic aspects of each project. 3D graphics scripting will be introduced. (N3DG-100, N3DG-110)
Class 2, Lab 3, Credit 3 (S)

5.0 Possible resources (texts, references, computer packages, etc.)

5.1 3D Software, Image Manipulation Software
5.2 Software-based tutorials and reference materials
5.3 Online tutorials
5.4 Articles, handouts, examples provided by the instructor

6.0 Topics (outline):

6.1 Visual and verbal vocabulary of the production pipeline in 3D graphics
  6.1.1. Composition, visualization techniques and 3D camera settings.
6.2 Review and analyze objects for modeling strategies
  6.2.1. Research and collect references for 3D modeling
  6.2.2. Project Planning
6.3 Develop an understanding of modeling techniques
  6.3.1 Techniques: high-poly modeling and low-poly modeling
6.4 Introduction to composition and visualization techniques using 3D software's camera.
  6.4.1. Basic Shot Framing
  6.4.2. Basic Composition Rules
6.5 Introduction to Simulation and Effects within 3D software
6.6 Introduction to MEL
6.7 Managing scenes, files and projects within 3D Software
6.8 Introduction to art/layout techniques
  6.8.1. Orthographic Views
  6.8.2. Perspective Views
6.9 Presentation skills

7.0 Intended course learning outcomes and associated assessment methods of those outcomes (please include as many Course Learning Outcomes as appropriate, one outcome and assessment method per row).

Course Learning Outcome	Assessment Method
7.1 Recognize the role of production pipelines and concept art development in analyzing objects to create complex models. (3.1, 3.2)	Successful completion of written assignments and projects.
7.2 Identify the various 3D modeling tools, techniques and rendering solutions. (3.3)	Successful completion of quizzes and projects per specified criteria.
7.3 Apply design compositions and visualization techniques using 3D software's camera. (3.4)	Successful completion of projects.
7.5 Use 3D scripting languages. (3.5)	Successful completion of projects.
7.6 Utilize industry standards when organizing scenes, files and projects using 3D software (3.6)	Successful completion of projects.
7.7 Design concept art and layouts using 3D techniques. (3.7)	Successful completion of projects.

7.8 Demonstrate ability to work successfully as part of a team to solve design problems and critiquing methods. (3.8)	Successful completion of projects.
7.9 Examine and analyze career opportunities within 3D graphics. (3.9)	Successful completion of written assignments.
7.10 Demonstrate presentation skills, including creation and organization of demo reel/portfolio. (3.10)	Successful completion of projects.

8.0 Program outcomes and/or goals supported by this course

8.1 Develop a high degree of technical competence in traditional media drawing and painting, as well as in animation, modeling, 3D printing, and computer-based skills in 2D and 3D graphics software.
8.2 Demonstrate the creative and technical skills required to create 3D graphics, 3D printouts, architectural visualization graphics, and building 3D models used in multimedia and animation.
8.3 Demonstrate skills related to project management and teamwork.
8.4 Develop effective communication, collaboration, and interpersonal skills.

9.0 N/A

	General Education Learning Outcome Supported by the Course, if appropriate	**Assessment Method**
Communication		
	Express oneself effectively in common college-level written forms using standard American English	
	Revise and improve written products	
	Express oneself effectively in presentations, either in spoken standard American English or sign language (American Sign Language or English-based Signing)	
	Comprehend information accessed through reading and discussion	
Intellectual Inquiry		
	Review, assess, and draw conclusions about hypotheses and theories	
	Analyze arguments, in relation to their premises, assumptions, contexts, and conclusions	
	Construct logical and reasonable arguments that include anticipation of counterarguments	
	Use relevant evidence gathered through accepted scholarly methods and properly acknowledge sources of	
Ethical, Social and Global Awareness		
	Analyze similarities and differences in human experiences and consequent perspectives	
	Examine connections among the world's populations	
	Identify contemporary ethical questions and relevant stakeholder positions	
Scientific, Mathematical and Technological Literacy		
	Demonstrate knowledge of basic principles and concepts	

	one of the natural sciences	
	Apply methods of scientific inquiry and problem solving to contemporary issues	
	Comprehend and evaluate mathematical and statistical information	
	Perform college-level mathematical operations or apply statistical techniques	
	Describe the potential and the limitations of technology	
	Use appropriate technology to achieve desired outcomes	
Creativity, Innovation and Artistic Literacy		
	Demonstrate creative/innovative approaches to course-based assignments or projects	
	Interpret and evaluate artistic expression considering the cultural context in which it was created	

10.0 Other relevant information (such as special classroom, studio, or lab needs, Special scheduling, media requirements, etc.)

10.1 Classroom needs student workstation computers equipped with high-end 3D software and other support software, as appropriate.

10.2 Instructor station needs same software and hardware as student workstations and a projection system with sound.

***Optional course designation; approval request date:** This is the date that the college curriculum committee forwards this course to the appropriate optional course designation curriculum committee for review. The chair of the college curriculum committee is responsible to fill in this date.

****Optional course designation; approval granted date:** This is the date the optional course designation curriculum committee approves a course for the requested optional course designation. The chair of the appropriate optional course designation curriculum committee is responsible to fill in this date.

ROCHESTER INSTITUTE OF TECHNOLOGY
COURSE PROPOSAL FORM

National Technical Institute for the Deaf

Visual Communications Studies Department

NEW (or REVISED) COURSE
NTID-N3DG-140 3D Lighting and Materials

1.0 Course Designations and Approvals

Required course approvals:	**Approval request date:**	**Approval granted date:**
Academic Unit Curriculum Committee	10/21/14	10/21/14
College Curriculum Committee	1/30/15	4/2/15

Optional designations:	**Is designation desired?**		***Approval request date:**	****Approval granted date:**
General Education:		No		
Writing Intensive:		No		
Honors		No		

2.0 Course information:

Course title:	**3D Lighting and Materials**
Credit hours:	3
Prerequisite(s):	N3DG-100 Design Drawing, N3DG-110 Basic 3D Modeling
Co-requisite(s):	
Course proposed by:	Heather L. Smith
Effective date:	Academic Year 2016-17

	Contact hours	**Maximum students/section**
Classroom	2	10
Lab	3	10
Studio		
Other (specify)		

2.a Semester(s) offered (check)

Fall	Spring x	Summer	Other

All courses must be offered at least once a year. If course will be offered on a bi-annual basis, please indicate here:

2.b Student Requirements

Students required to take this course: (by program and year, as appropriate) 1st year 3DGT Students
Students who might elect to take the course: Other students by VCS departmental approval

In the sections that follow, please use sub-numbering as appropriate (e.g. 3.1, 3.2, etc.)

3.0 Goals of the course (including rationale for the course, when appropriate):

3.1 Understand and interpret the interaction of light and materials attributes.
3.2 Understand how to analyze real world lights and textures.
3.3 Understand lighting fundamentals.
3.4 Understand different types of lightings within 3D software.
3.5 Learn and understand shading.
3.6 Use and understand layered shaders and maps.
3.7 Understand shading networks.
3.8 Understand UV mapping.
3.9 Learn about rendering techniques.
3.10Understand about photorealistic rendering.
3.11Develop team and individual approaches to problem solving and critiquing.
3.12Develop professional quality rendered images for use in presentations and portfolio.
3.13Develop reading, writing, analytical thinking, and problem solving skills,

4.0 Course description (as it will appear in the RIT Catalog, including pre- and co-requisites, and semesters offered). Please use the following format:

Course number: Name of Course
Description as you want it to appear in the catalog. (Pre or co-requisites)
Class X, Lab X, Credit X (Semester offered)

N3DG-140 3D Lighting and Materials.
This course is an introduction to the development of surface materials in 3D software, using concepts covered in N3DG-110, Basic 3D Modeling. The emphasis on the course will be on researching and understanding the interaction of light and surface, utilizing materials, shaders, textures mapping, cameras, resolution of geometry, and rendering. Techniques for UV layout are introduced. Principles of additive and subtractive color are introduced as they relate to the interpretation of physical phenomena within a virtual world. Projects focus on using color, value and texture to enhance the representation of form and space. (N3DG-100, N3DG-110)
Class 2, Lab 3, Credit 3 (S)

5.0 Possible resources (texts, references, computer packages, etc.)

5.1 3D Software, Image Manipulation Software
5.2 Maya tutorials and reference materials
5.3 Online tutorials
5.4 Articles, handouts, examples provided by the instructor

6.0 Topics (outline):

6.1 Visual and verbal vocabulary of 3D design in lighting and textures.
6.2 Basic Lighting Fundamentals
- 6.2.1 Reflection
- 6.2.2 Diffuse Color
- 6.2.3 Specular highlights
- 6.2.4 Translucency and Transparency
- 6.2.5 Three-Point Lighting

6.3 Types of lightings within 3D software
- 6.3.1 Spot Lights
- 6.3.2 Directional lights
- 6.3.3 Ambient Lights
- 6.3.4 Point lights
- 6.3.5 Area lights
- 6.3.6 Volume lights

6.4 Introduction to basic type of materials, lights, and special effects
6.5 Introduction to layered shaders and maps
- 6.5.1 Diffuse, Normal and Specular Maps
- 6.5.2 Color, bump, specular, transparency, and other maps

6.6 Introduction to Shading Network
6.7 Introduction to UV mapping
- 6.7.1 UV Texture Layout
- 6.7.2 UV Coordinates
- 6.7.2 Editing UV
- 6.7.3 Organizing UV Shells

6.8 Understand the difference between renders
- 6.8.1 Global illumination, non-photo real rendering, render layers, alpha channels
- 6.8.2 Anti-Aliasing, resolution, alpha channels
- 6.8.3 Raycast, raytrace, non-photorealistic rendering

6.9 File management, file referencing
6.10 Professional presentation of works

7.0 Intended course learning outcomes and associated assessment methods of those outcomes (please include as many Course Learning Outcomes as appropriate, one outcome and assessment method per row).

Course Learning Outcome	Assessment Method
7.1 Identify the interaction of light and textures attributes in 3D models. (3.1)	Successful completion of written assignments or quizzes.
7.2 Examine and analyze how the real world is interpreted with lighting and texturing of 3D models. (3.2)	Successful completion of projects.
7.3 Outline and breakdown the lighting fundamentals in 3D models. (3.3)	Successful completion of projects.
7.4 Analyze the different types of lightings within 3D software. (3.4)	Successful completion of projects.
7.5 Create and modify surface shading, layered shaders and maps using software. (3.5, 3.6)	Successful completion of projects.
7.6 Recognize and compute shading networks using 3D software. (3.7)	Successful completion of written assignments, quizzes, and projects per specified criteria.
7.7 Identify, analyze and reproduce UV mapping and its techniques using software. (3.8)	Successful completion of projects.
7.8 Identify and demonstrate an understanding of rendering techniques with lighting in preparation for professional practice. (3.9, 3.10)	Successful completion of projects.
7.9 Demonstrate ability to work successfully as part of a team to solve design problems. (3.11)	Successful demonstration of team problem solving and critiquing methods per specified criteria.
7.10 Demonstrate effective presentation skills using visual/oral presentation (3.12)(3.13)	Successful demonstration of presentation skills per specified criteria.

8.0 Program outcomes and/or goals supported by this course

8.1 Develop a high degree of technical competence in traditional media drawing and painting, as well as in animation, modeling, 3D printing, and computer-based skills in 2D and 3D graphics software.
8.2 Demonstrate the creative and technical skills required to create 3D graphics, 3D printouts, architectural visualization graphics, and building 3D models used in multimedia and animation.
8.3 Demonstrate skills related to project management and teamwork.
8.4 Develop effective communication, collaboration, and interpersonal skills.

9.0 N/A

	General Education Learning Outcome Supported by the Course, if appropriate	Assessment Method
Communication		
	Express oneself effectively in common college-level written forms using standard American English	
	Revise and improve written products	
	Express oneself effectively in presentations, either in spoken standard American English or sign language (American Sign Language or English-based Signing)	
	Comprehend information accessed through reading and discussion	
Intellectual Inquiry		
	Review, assess, and draw conclusions about hypotheses and theories	
	Analyze arguments, in relation to their premises, assumptions, contexts, and conclusions	
	Construct logical and reasonable arguments that include anticipation of counterarguments	
	Use relevant evidence gathered through accepted scholarly methods and properly acknowledge sources of information	
Ethical, Social and Global Awareness		
	Analyze similarities and differences in human experiences and consequent perspectives	
	Examine connections among the world's populations	
	Identify contemporary ethical questions and relevant stakeholder positions	
Scientific, Mathematical and Technological Literacy		
	Demonstrate knowledge of basic principles and concepts of one of the natural sciences	
	Apply methods of scientific inquiry and problem solving to contemporary issues	
	Comprehend and evaluate mathematical and statistical information	
	Perform college-level mathematical operations or apply statistical techniques	
	Describe the potential and the limitations of technology	
	Use appropriate technology to achieve desired outcomes	
Creativity, Innovation and Artistic Literacy		
	Demonstrate creative/innovative approaches to course-based assignments or projects	
	Interpret and evaluate artistic expression considering the cultural context in which it was created	

10.0 Other relevant information (such as special classroom, studio, or lab needs, Special scheduling, media requirements, etc.)

10.1 Classroom needs student workstation computers equipped with high-end 3D software and other support software, as appropriate. 10.2 Instructor station needs same software and hardware as student workstations and a projection system with sound.

***Optional course designation; approval request date:** This is the date that the college curriculum committee forwards this course to the appropriate optional course designation curriculum committee for review. The chair of the college curriculum committee is responsible to fill in this date.

****Optional course designation; approval granted date:** This is the date the optional course designation curriculum committee approves a course for the requested optional course designation. The chair of the appropriate optional course designation curriculum committee is responsible to fill in this date.

ROCHESTER INSTITUTE OF TECHNOLOGY
COURSE PROPOSAL FORM

National Technical Institute for the Deaf

Visual Communications Studies Department

NEW (or REVISED) COURSE
NTID- N3DG-210 Advanced 3D Modeling and Techniques

1.0 Course Designations and Approvals

Required course approvals:	**Approval request date:**	**Approval granted date:**
Academic Unit Curriculum Committee	10/21/14	10/21/14
College Curriculum Committee	1/30/15	4/2/15

Optional designations:	**Is designation desired?**		***Approval request date:**	****Approval granted date:**
General Education:		No		
Writing Intensive:		No		
Honors		No		

2.0 Course information:

Course title:	**Advanced 3D Modeling and Techniques**
Credit hours:	3
Prerequisite(s):	N3DG-115 Intermediate 3D Modeling and Techniques
Co-requisite(s):	
Course proposed by:	Heather L. Smith
Effective date:	Academic Year 2016-17

	Contact hours	**Maximum students/section**
Classroom	2	10
Lab	3	10
Studio		
Other (specify)		

2.a Semester(s) offered (check)

Fall x	Spring	Summer	Other

All courses must be offered at least once a year. If course will be offered on a bi-annual basis, please indicate here:

2.b Student Requirements

Students required to take this course: (by program and year, as appropriate) 2nd year 3DGT Students
Students who might elect to take the course: Other students by VCS departmental approval

In the sections that follow, please use sub-numbering as appropriate (e.g. 3.1, 3.2, etc.)

3.0 Goals of the course (including rationale for the course, when appropriate):

3.1 Develop reading, writing, analytical thinking, and problem solving skills related to advanced 3D modeling and production pipelines.
3.2 Foster deeper conceptualizations related to complex project planning.
3.3 Comprehend 3D modeling, texturing and lighting strategies.
3.4 Understand shaders, lighting, and rendering techniques.
3.5 Introduce students to digital compositing.
3.6 Introduce students to digital sculpting.
3.7 Introduce students to the creation of stereoscopic images.
3.8 Develop team and individual approaches to problem-solving and critiquing methods.
3.9 Develop professional quality rendered images for use in presentations and portfolio.

4.0 Course description (as it will appear in the RIT Catalog, including pre- and co-requisites, and semesters offered). Please use the following format:

Course number: Name of Course Description as you want it to appear in the catalog. (Pre or co-requisites) **Class X, Lab X, Credit X (Semester offered)**

N3DG-210 Advanced 3D Modeling and Techniques:
This course is a comprehensive review of modeling techniques that are useful in developing environments, interiors, spaces, objects, and characters to create complex models of organic and inorganic forms. The course will cover the understanding of proportions appropriate to a variety of environments, lighting for spaces, surface design to replicate real world materials, and building to an appropriate level of detail for the project. Additional techniques for 3D compositing and digital sculpting are introduced, as well as concepts for creating stereoscopic images. The course will emphasize researching and problem solving. (N3DG-115)
Class 2, Lab 3, Credit 3 (F)

5.0 Possible resources (texts, references, computer packages, etc.)

5.1 3D Software, Image Manipulation Software
5.2 Maya tutorials and reference materials
5.3 Online tutorials
5.4 Articles, handouts, examples provided by the instructor

6.0 Topics (outline):

6.1 Visual and verbal vocabulary of production pipelines in 3D graphics.
6.2 Advanced 3D modeling strategies
6.3 Advanced shaders, lighting and rendering techniques
6.4 Advanced shading networks
  6.4.1 Layered shaders and maps
  6.4.2 Custom connections and color utilities
6.5 Advanced UV mapping techniques
6.6 Introduction to compositing
6.7 Introduction to digital sculpting
6.8 Introduction to stereoscopic images
6.9 Presentation skills

7.0 Intended course learning outcomes and associated assessment methods of those outcomes (please include as many Course Learning Outcomes as appropriate, one outcome and assessment method per row).

Course Learning Outcome	Assessment Method
7.1 Identify essential elements of the production pipeline, project planning, and concept art development. (3.1, 3.2)	Successful completion of written assignments.
7.2 Apply complex 3D modeling, texturing and lighting strategies. (3.3)	Successful completion of projects.
7.3 Utilize shaders and lightings, and rendering techniques. (3.4)	Successful completion of projects.
7.4 Define and illustrate the process for creating digital compositing and use the appropriate rendering techniques. (3.5)	Successful completion of projects.
7.5 Demonstrate ability to create digital sculpting. (3.6)	Successful completion of projects.
7.6 Create stereoscopic images using appropriate tools and techniques. (3.7)	Successful completion of projects.
7.7 Demonstrate ability to work successfully as part of a team to solve design problems and to accept and offer positive critique methods. (3.8)	Successful demonstration of team problem solving and critiquing methods.
7.8 Demonstrate effective presentation skills, including creation of demo reel/portfolio. (3.9)	Successful demonstration of presentation skills.

8.0 Program outcomes and/or goals supported by this course

8.1 Develop a high degree of technical competence in traditional media drawing and painting, as well as in animation, modeling, 3D printing, and computer-based skills in 2D and 3D graphics software.
8.2 Demonstrate the creative and technical skills required to create 3D graphics, 3D printouts, architectural visualization graphics, and building 3D models used in multimedia and animation.
8.3 Demonstrate skills related to project management and teamwork.

9.0 N/A

	General Education Learning Outcome Supported by the Course, if appropriate	**Assessment Method**
Communication		
	Express oneself effectively in common college-level written forms using standard American English	
	Revise and improve written products	
	Express oneself effectively in presentations, either in spoken standard American English or sign language (American Sign Language or English-based Signing)	
	Comprehend information accessed through reading and discussion	
Intellectual Inquiry		
	Review, assess, and draw conclusions about hypotheses and theories	
	Analyze arguments, in relation to their premises, assumptions, contexts, and conclusions	
	Construct logical and reasonable arguments that include anticipation of counterarguments	
	Use relevant evidence gathered through accepted scholarly methods and properly acknowledge sources of information	
Ethical, Social and Global Awareness		
	Analyze similarities and differences in human experiences and consequent perspectives	
	Examine connections among the world's populations	
	Identify contemporary ethical questions and relevant stakeholder positions	
Scientific, Mathematical and Technological Literacy		
	Demonstrate knowledge of basic principles and concepts of one of the natural sciences	
	Apply methods of scientific inquiry and problem solving to contemporary issues	
	Comprehend and evaluate mathematical and statistical information	

	Perform college-level mathematical operations or apply statistical techniques	
	Describe the potential and the limitations of technology	
	Use appropriate technology to achieve desired outcomes	
Creativity, Innovation and Artistic Literacy		
	Demonstrate creative/innovative approaches to course-based assignments or projects	
	Interpret and evaluate artistic expression considering the cultural context in which it was created	

10.0 Other relevant information (such as special classroom, studio, or lab needs, Special scheduling, media requirements, etc.)

10.1 Classroom needs student workstation computers equipped with high-end 3D software and other support software, as appropriate.
10.2 Instructor station needs same software and hardware as student workstations and a projection system with sound.

***Optional course designation; approval request date:** This is the date that the college curriculum committee forwards this course to the appropriate optional course designation curriculum committee for review. The chair of the college curriculum committee is responsible to fill in this date.

****Optional course designation; approval granted date:** This is the date the optional course designation curriculum committee approves a course for the requested optional course designation. The chair of the appropriate optional course designation curriculum committee is responsible to fill in this date.

ROCHESTER INSTITUTE OF TECHNOLOGY
COURSE PROPOSAL FORM

National Technical Institute for the Deaf

Visual Communications Studies Department

NEW (or REVISED) COURSE
NTID- N3DG-220 Principles of 4D Design

1.0 Course Designations and Approvals

Required course approvals:	**Approval request date:**	**Approval granted date:**
Academic Unit Curriculum Committee	10/21/2014	10/21/2014
College Curriculum Committee	1/30/15	4/2/15

Optional designations:	**Is designation desired?**		***Approval request date:**	****Approval granted date:**
General Education:		No		
Writing Intensive:		No		
Honors:		No		

2.0 Course information:

Course title:	**Principles of 4D Design**
Credit hours:	3
Prerequisite(s):	N3DG-115 Intermediate 3D Modeling and Techniques
Co-requisite(s):	
Course proposed by:	Heather L. Smith
Effective date:	Academic Year 2016-17

	Contact hours	**Maximum students/section**
Classroom	2	10
Lab	3	10
Studio		
Other (specify)		

2.a Semester(s) offered (check)

Fall x	Spring	Summer	Other

All courses must be offered at least once a year. If course will be offered on a bi-annual basis, please indicate here:

2.b Student Requirements

Students required to take this course: (by program and year, as appropriate) 2nd year 3DGT Students
Students who might elect to take the course: Other students by VCS departmental approval

In the sections that follow, please use sub-numbering as appropriate (e.g. 3.1, 3.2, etc.)

3.0 Goals of the course (including rationale for the course, when appropriate):

3.1 Develop reading, writing, analytical thinking, and problem solving skills related to animation.
3.2 Learn about the historic fundamentals of animation, principles of modern animation, and concepts of motion using software.
3.3 Learn about workflow and create animated elements for use in time-based graphics.
3.4 Learn storytelling and storyboarding techniques to plan and develop concepts for animation.
3.5 Foster knowledge and skills to create animation for use in TV, film, streaming media, and for use in presentations and web pages.
3.6 Understand and use the appropriate applications to develop and create animations.
3.7 Learn how to create a demo reel and portfolio of animation projects created in the course.
3.8 Develop team and individual approaches to problem solving and critiquing methods.

4.0 Course description (as it will appear in the RIT Catalog, including pre- and co-requisites, and semesters offered). Please use the following format:

Course number: Name of Course Description as you want it to appear in the catalog. (Pre or co-requisites) **Class X, Lab X, Credit X (Semester offered)**

N3DG-220 Principles of 4D Design:
In this course, students will learn to develop illustrations and animated elements that use the fourth dimension, to create time-based 3D and 2D graphics. Course content includes historic fundamentals of animation, principles of modern animation, and concepts of motion using 3D and 2D software. An overview of animation and time-based motion will be introduced and discussed throughout the semester. Writing and storyboarding techniques for animation will be addressed. Vector and raster animation applications will be used. (N3DG-115) **Class 2, Lab 3, Credit 3 (F)**

5.0 Possible resources (texts, references, computer packages, etc.)

5.1 4D Software, Image Manipulation Software
5.2 Maya tutorials and reference materials
5.3 Online tutorials
5.4 Articles, handouts, examples provided by the instructor

6.0 Topics (outline):

6.1 History of animation, from frame-based hand drawn animation to computer animation
6.2 Concepts of computer animation
6.3 Introduction to principles of animations and fundamentals of basic movement
6.4 Writing and storyboarding for computer animation
6.5 Project Planning
6.6 Animatics
6.7 Visual and aesthetic issues; especially related to form and composition involving the fourth dimension that is time
6.8 Different techniques in compression and delivery methods to produce appropriate final animation files

7.0 Intended course learning outcomes and associated assessment methods of those outcomes (please include as many Course Learning Outcomes as appropriate, one outcome and assessment method per row).

Course Learning Outcome	Assessment Method
7.1 Review and identify basic elements and principles of design related to animation in 4D (3.1)	Successful completion of written assignments.
7.2 Identify and explain historic fundamentals of animation, principles of modern animation, and concepts of motion using software. (3.2)	Successful completion of projects.
7.3 Identify and utilize the workflow and create animated elements for use in time-based graphics. (3.3)	Successful completion of projects.
7.4 Draw and create storytelling using storyboarding techniques to outline the plan and develop concepts for animation. (3.4)	Successful completion of projects.
7.5 Identify and apply the settings to create animation for use in TV, film, streaming media, and for use in presentations and web pages. (3.5)	Successful completion of projects.
7.6 Identify applications and use the appropriate settings to develop and create animations. (3.6)	Successful completion of projects.
7.7 Demonstrate presentation skills, including creation and organization of demo reel/portfolio. (3.7)	Successful demonstration of presentation skills.

7.8 Work successfully as part of a team to solve design problems and to accept and offer positive critique methods. (3.8)	Successful demonstration of team problem solving and critiquing methods.

8.0 Program outcomes and/or goals supported by this course

8.1 Develop a high degree of technical competence in traditional media drawing and painting, as well as in animation, modeling, 3D printing, and computer-based skills in 2D and 3D graphics software.
8.2 Demonstrate the creative and technical skills required to create 3D graphics, 3D printouts, architectural visualization graphics, and building 3D models used in multimedia and animation.
8.3 Demonstrate skills related to project management and teamwork.
8.4 Develop effective communication, collaboration, and interpersonal skills.

9.0 N/A

	General Education Learning Outcome Supported by the Course, if appropriate	**Assessment Method**
Communication		
	Express oneself effectively in common college-level written forms using standard American English	
	Revise and improve written products	
	Express oneself effectively in presentations, either in spoken standard American English or sign language (American Sign Language or English-based Signing)	
	Comprehend information accessed through reading and discussion	
Intellectual Inquiry		
	Review, assess, and draw conclusions about hypotheses and theories	
	Analyze arguments, in relation to their premises, assumptions, contexts, and conclusions	
	Construct logical and reasonable arguments that include anticipation of counterarguments	
	Use relevant evidence gathered through accepted scholarly methods and properly acknowledge sources of	
Ethical, Social and Global Awareness		
	Analyze similarities and differences in human experiences and consequent perspectives	
	Examine connections among the world's populations	
	Identify contemporary ethical questions and relevant stakeholder positions	
Scientific, Mathematical and Technological Literacy		
	Demonstrate knowledge of basic principles and concepts of one of the natural sciences	

	Apply methods of scientific inquiry and problem solving to contemporary issues	
	Comprehend and evaluate mathematical and statistical information	
	Perform college-level mathematical operations or apply statistical techniques	
	Describe the potential and the limitations of technology	
	Use appropriate technology to achieve desired outcomes	
Creativity, Innovation and Artistic Literacy		
	Demonstrate creative/innovative approaches to course-based assignments or projects	
	Interpret and evaluate artistic expression considering the cultural context in which it was created	

10.0 **Other relevant information** (such as special classroom, studio, or lab needs, Special scheduling, media requirements, etc.)

10.1 Classroom needs student workstation computers equipped with high-end 3D software and other support software, as appropriate.
10.2 Instructor station needs same software and hardware as student workstations and a projection system with sound.

***Optional course designation; approval request date:** This is the date that the college curriculum committee forwards this course to the appropriate optional course designation curriculum committee for review. The chair of the college curriculum committee is responsible to fill in this date.

****Optional course designation; approval granted date:** This is the date the optional course designation curriculum committee approves a course for the requested optional course designation. The chair of the appropriate optional course designation curriculum committee is responsible to fill in this date.

ROCHESTER INSTITUTE OF TECHNOLOGY
COURSE PROPOSAL FORM

National Technical Institute for the Deaf

Visual Communications Studies Department

NEW (or REVISED) COURSE
NTID-N3DG-225 3D Motion

1.0 Course Designations and Approvals

Required course approvals:	**Approval request date:**	**Approval granted date:**
Academic Unit Curriculum Committee	10/21/2014	10/21/2014
College Curriculum Committee	1/30/15	4/2/15

Optional designations:	**Is designation desired?**		***Approval request date:**	****Approval granted date:**
General Education:		No		
Writing Intensive:		No		
Honors		No		

2.0 Course information:

Course title:	**3D Motion**
Credit hours:	
Prerequisite(s):	N3DG-220 Principles of 4D Design
Co-requisite(s):	
Course proposed by:	Heather L. Smith
Effective date:	Academic Year 2016-2017

	Contact hours	**Maximum students/section**
Classroom	2	10
Lab	3	10
Studio		
Other (specify)		

2.a Semester(s) offered (check)

Fall	Spring x	Summer	Other

All courses must be offered at least once a year. If course will be offered on a bi-annual basis, please indicate here:

2.b Student Requirements

Students required to take this course: (by program and year, as appropriate) 2nd year 3DGT Students
Students who might elect to take the course: Other students by VCS departmental approval

In the sections that follow, please use sub-numbering as appropriate (e.g. 3.1, 3.2, etc.)

3.0 Goals of the course (including rationale for the course, when appropriate):

3.1 Develop reading, writing, analytical thinking, and problem solving skills related to 3D Motion.
3.2 Understand the fundamental principles of animation.
3.3 Learn and understand inverse kinematics, rigging and deformers.
3.4 Learn and understand concepts about the interaction of light and surfaces.
3.5 Understand the basic concepts of compositing and rendering techniques.
3.6 Learn and develop skills for compositions in cinematography.
3.7 Learn and understand workflows in 3D Motion.
3.8 Develop team and individual approaches to problem solving and critiquing.
3.9 Develop a professional quality of rendering images for presentations and demo reels.

4.0 Course description (as it will appear in the RIT Catalog, including pre- and co-requisites, and semesters offered). Please use the following format:

Course number: Name of Course
Description as you want it to appear in the catalog. (Pre or co-requisites)
Class X, Lab X, Credit X (Semester offered)

N3DG-225 3D Motion:
This course is an introduction to motion using three- dimensional software. The course focuses on the development of visual and verbal vocabulary as a means of exploring, developing, and understanding motion with digital geometry and in virtual spaces. Subjects covered include inverse kinematics, rigging and deformers, interaction of light and surface, basic concept of compositing, and rendering. Perception and visual thinking are emphasized in the development of projects. Projects will include modeling organic and inorganic forms, composition, level of detail, creation of space and motion. Structured assignments develop skills in concept generation, basic form making, techniques for creating motion, and craftsmanship. Emphasis is placed on workflow, teamwork, and the technical and aesthetic aspects of each project.
(N3DG-220)
Class 2, Lab 3, Credit 3 (S)

5.0 Possible resources (texts, references, computer packages, etc.)

5.1 3D Software, Image Manipulation Software
5.2 Maya tutorials and reference materials
5.3 Online tutorials
5.4 Articles, handouts, examples provided by the instructor

6.0 Topics (outline):

6.1 Visual and verbal vocabulary of design in 3D Motion
6.2 Basic Principles of Animation
6.3 Writing, planning, concept development and storyboarding
6.4 Basic Computer Animation Techniques
  6.4.1. Principles of Keyframe Interpolation
  6.4.2. Model Animation
  6.4.3. Camera Animation
  6.4.4. Light Animation
  6.4.5. Inverse Kinematics
  6.4.6. Rigging
  6.4.7. Deformers
6.5 Basic Concept of Compositing and Color Correction
6.6 Basic Cinematic Techniques
  6.6.1. Pan, Tilt, Dolly, Tracking, Zoom, and Transitions
  6.6.2. Frame Shots: Full, Medium, Medium Close up, Close-up and Extreme Close-up
6.7 Project planning
6.8 Team dynamics
6.9 Presentation skills

7.0 Intended course learning outcomes and associated assessment methods of those outcomes (please include as many Course Learning Outcomes as appropriate, one outcome and assessment method per row).

Course Learning Outcome	Assessment Method
7.1 Review and identify the basic elements and principles of design using in 3D Motion. (3.1)	Successful completion of written assignments.
7.2 Identify and illustrate examples of fundamental principles of animation. (3.2)	Successful completion of projects.
7.3 Identify and operate tools to create models using inverse kinematics, rigging and deformers. (3.3)	Successful completion of projects.
7.4 Demonstrate the interactions of lights and surfaces using 3D motions. (3.4)	Successful completion of projects.
7.5 Analyze and apply techniques for compositing and rendering to produce an output. (3.5)	Successful completion of projects.
7.6 Apply analytical thinking and problem solving related to settings of 3D camera and use of cinematography techniques. (3.6)	Successful completion of projects.

7.7 Develop and identify the process of workflow in 3D motion. (3.7)	Successful completion of written assignments.
7.8 Work successfully as part of a team to solve design problems. (3.8)	Successful demonstration of team problem solving and critiquing methods.
7.9 Demonstrate effective presentation skills, visual/oral presentation, and demo reels. (3.9)	Successful demonstration of presentation skills.

8.0 Program outcomes and/or goals supported by this course

8.1 Develop a high degree of technical competence in traditional media drawing and painting, as well as in animation, modeling, 3D printing, and computer-based skills in 2D and 3D graphics software.
8.2 Demonstrate the creative and technical skills required to create 3D graphics, 3D printouts, architectural visualization graphics, and building 3D models used in multimedia and animation.
8.3 Demonstrate skills related to project management and teamwork.
8.4 Develop effective communication, collaboration, and interpersonal skills.

9.0 N/A

	General Education Learning Outcome Supported by the Course, if appropriate	**Assessment Method**
Communication		
	Express oneself effectively in common college-level written forms using standard American English	
	Revise and improve written products	
	Express oneself effectively in presentations, either in spoken standard American English or sign language (American Sign Language or English-based Signing)	
	Comprehend information accessed through reading and discussion	
Intellectual Inquiry		
	Review, assess, and draw conclusions about hypotheses and theories	
	Analyze arguments, in relation to their premises, assumptions, contexts, and conclusions	
	Construct logical and reasonable arguments that include anticipation of counterarguments	
	Use relevant evidence gathered through accepted scholarly methods and properly acknowledge sources of	
Ethical, Social and Global Awareness		
	Analyze similarities and differences in human experiences and consequent perspectives	
	Examine connections among the world's populations	
	Identify contemporary ethical questions and relevant	

	stakeholder positions	
Scientific, Mathematical and Technological Literacy		
	Demonstrate knowledge of basic principles and concepts of one of the natural sciences	
	Apply methods of scientific inquiry and problem solving to contemporary issues	
	Comprehend and evaluate mathematical and statistical information	
	Perform college-level mathematical operations or apply statistical techniques	
	Describe the potential and the limitations of technology	
	Use appropriate technology to achieve desired outcomes	
Creativity, Innovation and Artistic Literacy		
	Demonstrate creative/innovative approaches to course-based assignments or projects	
	Interpret and evaluate artistic expression considering the cultural context in which it was created	

10.0 Other relevant information (such as special classroom, studio, or lab needs, Special scheduling, media requirements, etc.)

10.1 Classroom needs student workstation computers equipped with high-end 3D software and other support software, as appropriate.

10.2 Instructor station needs same software and hardware as student workstations and a projection system with sound.

***Optional course designation; approval request date:** This is the date that the college curriculum committee forwards this course to the appropriate optional course designation curriculum committee for review. The chair of the college curriculum committee is responsible to fill in this date.

****Optional course designation; approval granted date:** This is the date the optional course designation curriculum committee approves a course for the requested optional course designation. The chair of the appropriate optional course designation curriculum committee is responsible to fill in this date.

ROCHESTER INSTITUTE OF TECHNOLOGY
COURSE PROPOSAL FORM

National Technical Institute for the Deaf

Visual Communications Studies Department

NEW (or REVISED) COURSE
NTID-N3DG-230 3D Printing

1.0 Course Designations and Approvals

Required course approvals:	**Approval request date:**	**Approval granted date:**
Academic Unit Curriculum Committee	10/21/2014	10/21/2014
College Curriculum Committee	1/30/15	4/2/15

Optional designations:	**Is designation desired?**		***Approval request date:**	****Approval granted date:**
General Education:		No		
Writing Intensive:		No		
Honors		No		

2.0 Course information:

Course title:	3D Printing
Credit hours:	3
Prerequisite(s):	N3DG-210 Advanced 3D Modeling and Techniques
Co-requisite(s):	None
Course proposed by:	Kurt Stoskopf
Effective date:	Academic Year 2016-17

	Contact hours	**Maximum students/section**
Classroom	2	10
Lab	3	10
Studio		
Other (specify)		

2.a Semester(s) offered (check)

Fall	Spring **X**	Summer	Other

All courses must be offered at least once every 2 years. If course will be offered on a bi-annual basis, please indicate here:

2.b Student Requirements

Students required to take this course: 2nd year 3DGT Students
Students who might elect to take the course: Other students by VCS departmental approval.

In the sections that follow, please use sub-numbering as appropriate (e.g. 3.1, 3.2, etc.)

3.0 Goals of the course (including rationale for the course, when appropriate):

The goals for this course are to provide experiences enabling the students to:	
3.1	Develop reading, writing, analytical thinking, and problem solving skills related to 3D printing.
3.2	Develop the knowledge and skills to prepare, print, and finish 3D prints that satisfy project requirements.
3.3	Learn basic 3D modeling skills to create models that are structurally appropriate for 3D printing and use printed resources efficiently.
3.4	Identify career opportunities in 3D printing.

4.0 Course description (as it will appear in the RIT Catalog, including pre- and co-requisites, and semesters offered). Please use the following format:

N3DG-230 3D Printing:
This course introduces students to the skills needed for the production and creation of three-dimensional printed objects using 3D modeling and production software. Students will work in 3D applications, producing and editing with the tools and techniques offered by the software programs. Structural modeling techniques and modeling approaches to creating physical 3D objects with 3D printers will be taught. The use of materials in 3D printing will be discussed and demonstrated, and students will gain an understanding of the use of specific materials to satisfy printing requirements. Additional topics will include the relevance of file format specifications in modeling, comparing differences in design approaches between 3D modeling and 3D printing, and operating 3D printers under different conditions. Capabilities of different 3D printer models will be discussed. Comprehension and correct usage of terminology and concepts are emphasized. (N3DG-210)
Class 2, Lab 3, Credit 3 (S)

5.0 Possible resources (texts, references, computer packages, etc.)

5.1	Handouts and manuals
5.2	Books and technical journals
5.3	Software
5.4	Website resources

6.0 Topics (outline):

6.1	Overview of the 3D printing industry
6.2	Introduction to 3D printing concepts
6.3	Materials used in 3D printing
6.4	File formats used in 3D printing
6.5	Modeling concepts for 3D output
6.6	Structural considerations for 3D printing
6.7	Operating and safety practices for 3D printing
6.8	3D printing
6.9	Troubleshooting 3D printing problems
6.10	Finishing 3D prints

7.0 Intended course learning outcomes and associated assessment methods of those outcomes (please include as many Course Learning Outcomes as appropriate, one outcome and assessment method per row).

Course Learning Outcome	Assessment Method
7.1 Identify critical elements and demonstrate an understanding of professional ethics, workplace expectations and production pipeline in the field of 3D Printing. (3.1)	Successful completion of classroom presentations.
7.2 Use appropriate software applications and hardware systems in the design and production of 3D graphics projects. (3.2)	Successful completion of projects.
7.3 Demonstrate ability to research and record findings about career opportunities in the area of	Successful completion of written assignments.
7.4 Exhibit individual competence in 3D printing and production of professional quality 3D media. (3.4)	Successful completion of projects.

8.0 Program outcomes and/or goals supported by this course

8.1 Develop a high degree of technical competence in traditional media drawing and painting, as well as in animation, modeling, 3D printing, and computer-based skills in 2D and 3D graphics software.
8.2 Demonstrate the creative and technical skills required to create 3D graphics, 3D printouts, architectural visualization graphics, and building 3D models used in multimedia and animation.
8.3 Demonstrate skills related to project management and teamwork.
8.4 Develop effective communication, collaboration, and interpersonal skills.

9.0 N/A

	General Education Learning Outcome Supported by the Course, if appropriate	**Assessment Method**
Communication		
	Express oneself effectively in common college-level written forms using standard American English	
	Revise and improve written products	
	Express oneself effectively in presentations, either in spoken standard American English or sign language (American Sign Language or English-based Signing)	
	Comprehend information accessed through reading and discussion	
Intellectual Inquiry		
	Review, assess, and draw conclusions about hypotheses and theories	
	Analyze arguments, in relation to their premises, assumptions, contexts, and conclusions	
	Construct logical and reasonable arguments that include anticipation of counterarguments	
	Use relevant evidence gathered through accepted scholarly methods and properly acknowledge sources of information	
Ethical, Social and Global Awareness		
	Analyze similarities and differences in human experiences and consequent perspectives	
	Examine connections among the world's populations	
	Identify contemporary ethical questions and relevant stakeholder positions	
Scientific, Mathematical and Technological Literacy		
	Demonstrate knowledge of basic principles and concepts of one of the natural sciences	
	Apply methods of scientific inquiry and problem solving to contemporary issues	
	Comprehend and evaluate mathematical and statistical information	
	Perform college-level mathematical operations or apply statistical techniques	

	Describe the potential and the limitations of technology	
	Use appropriate technology to achieve desired outcomes	
Creativity, Innovation and Artistic Literacy		
	Demonstrate creative/innovative approaches to course-based assignments or projects	
	Interpret and evaluate artistic expression considering the cultural context in which it was created	

10.0 Other relevant information (such as special classroom, studio, or lab needs, special scheduling, media requirements, etc.)

10.1	This course will be taught in the Visual Communication Studies department classrooms and laboratories.
10.2	3D printers in the Visual Communication Studies labs will be utilized in this course.
10.3	Each Visual Communication Studies lab is equipped with individual student workstations, a teacher's workstation, a computer projector, whiteboard, and worktables.

***Optional course designation; approval request date:** This is the date that the college curriculum committee forwards this course to the appropriate optional course designation curriculum committee for review. The chair of the college curriculum committee is responsible to fill in this date.

****Optional course designation; approval granted date:** This is the date the optional course designation curriculum committee approves a course for the requested optional course designation. The chair of the appropriate optional course designation curriculum committee is responsible to fill in this date.

ROCHESTER INSTITUTE OF TECHNOLOGY
COURSE PROPOSAL FORM

National Technical Institute for the Deaf

Visual Communications Studies Department

NEW (or REVISED) COURSE
NTID- N3DG 260 Professional Practices

1.0 Course Designations and Approvals

Required course approvals:	**Approval request date:**	**Approval granted date:**
Academic Unit Curriculum Committee	10/21/2014	10/21/2014
College Curriculum Committee	1/30/15	4/2/15

Optional designations:	**Is designation desired?**		***Approval request date:**	****Approval granted date:**
General Education:		No		
Writing Intensive:		No		
Honors		No		

2.0 Course information:

Course title:	**Professional Practices**
Credit hours:	3
Prerequisite(s):	NAIS-201 Employment Seminar
Co-requisite(s):	
Course proposed by:	Heather L. Smith, Kurt Stoskopf
Effective date:	Academic Year 2016-17

	Contact hours	**Maximum students/section**
Classroom	2	10
Lab	2	10
Studio		
Other (specify)		

2.a Semester(s) offered (check)

Fall	Spring x	Summer	Other

All courses must be offered at least once a year. If course will be offered on a bi-annual basis, please indicate here:

2.b Student Requirements

Students required to take this course: (by program and year, as appropriate) 2nd year 3DGT Students
Students who might elect to take the course: Other students by VCS departmental approval

In the sections that follow, please use sub-numbering as appropriate (e.g. 3.1, 3.2, etc.)

3.0 Goals of the course (including rationale for the course, when appropriate):

3.1 Develop reading, writing and analytical thinking related to 3D Graphics business practices.
3.2 Foster an understanding the professional ethics, workplace expectations and production pipeline in the field of 3D Graphics.
3.3 Foster an understanding and develop strategies in leadership, teamwork, and collaboration.
3.4 Understand career opportunities in the area of 3D Graphics.
3.5 Understand and develop skills in networking with self-promotion and marketing.
3.6 Develop team and individual approaches to problem solving and critiquing.

4.0 Course description (as it will appear in the RIT Catalog, including pre- and co-requisites, and semesters offered). Please use the following format:

Course number: Name of Course Description as you want it to appear in the catalog. (Pre or co-requisites) **Class X, Lab X, Credit X (Semester offered)**

N3DG-260 Professional Practices:
The course focuses on preparing students to be ready to seek employment in the 3D graphics industry. Subjects covered include professional ethics, workplace expectations, production pipeline and an overview of copyright issues. Strategies for developing leadership, teamwork, and collaboration will be discussed. Successful self-promotion and marketing, including the development of demo reels will be introduced, along with emphasizing the importance of joining professional organizations and submission of work to competitions for the purpose of professional networking. (NAIS-201)
Class 2, Lab 2, Credit 3 (S)

5.0 Possible resources (texts, references, computer packages, etc.)

5.1 3D Software, Image Manipulation Software
5.2 Maya tutorials and reference materials
5.3 Online tutorials
5.4 Articles, handouts, examples provided by the instructor

6.0 Topics (outline):

6.1 Business Practices in the field of 3D Graphics
6.1.1. Professional ethics and work expectations.
6.1.2. Production pipeline fundamentals.
6.1.3. Research of current trends and future technologies developments.
6.1.4. Leadership, Teamwork and Collaboration.
6.1.5. Professional Organizations and networking.
6.2. Cover letter, resumes, and demo reels.
6.2.1. Methods of preparing and making demo reels.
6.2.2 Presentation Skills.
6.2.3. Self-promotion and Marketing.

7.0 Intended course learning outcomes and associated assessment methods of those outcomes (please include as many Course Learning Outcomes as appropriate, one outcome and assessment method per row).

Course Learning Outcome	Assessment Method
7.1 Identify and demonstrate an understanding about the professional ethics, workplace expectations and production pipeline in the field of 3D Graphics. (3.1, 3.2)	Successful completion of classroom presentations.
7.2 Explain and apply strategies in leadership, teamwork, and collaboration. (3.3)	Successful completion of written assignments.
7.3 Demonstrate ability to research and specify skills that are required within career opportunities in the area of 3D Graphics. (3.4)	Successful completion of written assignments.
7.4 Illustrate and apply networking skills for self-promotion and marketing. (3.5)	Successful completion of projects.
7.5 Demonstrate effective visual and oral presentation skills. (3.6)	Successful demonstration of presentation skills.

8.0 Program outcomes and/or goals supported by this course

8.1 Demonstrate skills related to project management and teamwork.
8.2 Develop effective communication, collaboration, and interpersonal skills.
8.3 Demonstrate the knowledge and skills necessary to function in a global society.

9.0 N/A

	General Education Learning Outcome Supported by the Course, if appropriate	**Assessment Method**
Communication		
	Express oneself effectively in common college-level written forms using standard American English	
	Revise and improve written products	
	Express oneself effectively in presentations, either in	

	standard American English or sign language (American Sign Language or English-based Signing)	
	Comprehend information accessed through reading and discussion	
Intellectual Inquiry		
	Review, assess, and draw conclusions about hypotheses and theories	
	Analyze arguments, in relation to their premises, assumptions, contexts, and conclusions	
	Construct logical and reasonable arguments that include anticipation of counterarguments	
	Use relevant evidence gathered through accepted scholarly methods and properly acknowledge sources of information	
Ethical, Social and Global Awareness		
	Analyze similarities and differences in human experiences and consequent perspectives	
	Examine connections among the world's populations	
	Identify contemporary ethical questions and relevant stakeholder positions	
Scientific, Mathematical and Technological Literacy		
	Demonstrate knowledge of basic principles and concepts of one of the natural sciences	
	Apply methods of scientific inquiry and problem solving to contemporary issues	
	Comprehend and evaluate mathematical and statistical information	
	Perform college-level mathematical operations or apply statistical techniques	
	Describe the potential and the limitations of technology	
	Use appropriate technology to achieve desired outcomes	
Creativity, Innovation and Artistic Literacy		
	Demonstrate creative/innovative approaches to course-based assignments or projects	
	Interpret and evaluate artistic expression considering the cultural context in which it was created	

10.0 Other relevant information (such as special classroom, studio, or lab needs, Special scheduling, media requirements, etc.)

10.1	Classroom needs student workstation computers equipped with high-end 3D software and other support software, as appropriate.
10.2	Instructor station needs same software and hardware as student workstations and a projection system with sound.

***Optional course designation; approval request date:** This is the date that the college curriculum committee forwards this course to the appropriate optional course designation curriculum committee for review. The chair of the college curriculum committee is responsible to fill in this date.

****Optional course designation; approval granted date:** This is the date the optional course designation curriculum committee approves a course for the requested optional course designation. The chair of the appropriate optional course designation curriculum committee is responsible to fill in this date.

ROCHESTER INSTITUTE OF TECHNOLOGY
COURSE PROPOSAL FORM

NATIONAL TECHNICAL INSTITUTE
FOR THE DEAF

Visual Communications Studies Department

NEW (or REVISED) COURSE
NTID-N3DG-270 Capstone

1.0 Course Designations and Approvals

Required course approvals:	**Approval request date:**	**Approval granted date:**
Academic Unit Curriculum Committee	10/21/2014	10/21/2014
College Curriculum Committee	1/30/15	4/2/15

Optional designations:	**Is designation desired?**		***Approval request date:**	****Approval granted date:**
General Education:		No		
Writing Intensive:		No		
Honors		No		

2.0 Course information:

Course title:	**Capstone**
Credit hours:	3
Prerequisite(s):	NAIS-299 Co-op
Co-requisite(s):	
Course proposed by:	Heather L. Smith, Kurt Stoskopf
Effective date:	Academic Year 2016-17

	Contact hours	**Maximum students/section**
Classroom	2	10
Lab	3	10
Studio		
Other (specify)		

2.a Semester(s) offered (check)

Fall x	Spring	Summer	Other

All courses must be offered at least once every 2 years. If course will be offered on a bi-annual basis, please indicate here:

2.b Student Requirements

Students required to take this course: (by program and year, as appropriate) 3rd year 3DGT Students
Students who might elect to take the course: Other students by VCS departmental approval

In the sections that follow, please use sub-numbering as appropriate (e.g. 3.1, 3.2, etc.)

3.0 Goals of the course (including rationale for the course, when appropriate):

3.1 Explore a topic or industry issue, implement, complete, and present a capstone project.
3.2 Foster knowledge and skills to create 3D graphics for use in TV, film, streaming media, applications, and for use in presentations.
3.3 Develop team and individual approaches to problem-solving and critiquing methods.
3.4 Develop professional quality rendered images for use in presentations, portfolio, and demo reels.
3.5 Develop reading, writing, analytical thinking, and problem solving skills.

4.0 Course description (as it will appear in the RIT Catalog, including pre- and co-requisites, and semesters offered). Please use the following format:

Course number: Name of Course Description as you want it to appear in the catalog. (Pre or co-requisites) **Class X, Lab X, Credit X (Semester offered)**

N3DG-270 Capstone:
For this final course in 3D Graphics Technology, students will identify an area of exploration, where they have the opportunity to work on a semester-long project. Collaborative or individual projects will be supported, and students will work closely with their instructor to develop and implement a final project that will incorporate their skills, starting from the planning stage, through completion and project presentation. Collaborative projects require the clear definition of the responsibilities of each student involved and project management responsibilities. Faculty will support and provide guidance for student work exploring an industry and skill-related topic for their capstone project. (NAIS-299)
Class 2, Lab 3, Credit 3 (F)

5.0 Possible resources (texts, references, computer packages, etc.)

5.1 3D Software, Image Manipulation Software
5.2 Maya tutorials and reference materials
5.3 Online tutorials
5.4 Articles, handouts, examples provided by the instructor

6.0 Topics (outline):

6.1 Identifying appropriate topics for advanced exploration 6.2 Exploring new developments in the industry 6.3 Create and develop models, composition and motion using 3D graphics software 6.4 Rendering final images 6.5 Project planning 6.6 Team dynamics 6.7 Presentation skills 6.8 Education 6.9 Simulations 6.10 Movie shorts

7.0 Intended course learning outcomes and associated assessment methods of those outcomes (please include as many Course Learning Outcomes as appropriate, one outcome and assessment method per row).

Course Learning Outcome	Assessment Method
7.1 Demonstrate ability to explore a topic for advanced analysis; outline, implement and complete a capstone presentation related to	Successful completion of written assignments.
7.2 Demonstrate comprehensive knowledge and skills required for creating and completing 3D graphics for use in TV, film, streaming media, applications, and for use in presentations. (3.2)	Successful completion of written assignments.
7.3 Apply strategies in leadership, teamwork, and collaboration. (3.3)	Successful demonstration of team problem solving and critiquing methods.
7.4 Compute settings for rendering professional quality images for use in presentations, portfolio, and demo reels. (3.4)	Successful demonstration of presentation skills.

8.0 Program outcomes and/or goals supported by this course

8.1 Develop a high degree of technical competence in traditional media drawing and painting, as well as in animation, modeling, 3D printing, and computer-based skills in 2D and 3D graphics software. 8.2 Demonstrate skills related to project management and teamwork. 8.3 Develop effective communication, collaboration, and interpersonal skills. 8.4 Demonstrate the creative and technical skills required to create 3D graphics, 3D printouts, architectural visualization graphics, and building 3D models used in multimedia and animation.

9.0 N/A

	General Education Learning Outcome Supported by Course, if appropriate	Assessment Method
Communication		
	Express oneself effectively in common college-level written forms using standard American English	
	Revise and improve written products	
	Express oneself effectively in presentations, either in spoken standard American English or sign language (American Sign Language or English-based Signing)	
	Comprehend information accessed through reading and discussion	
Intellectual Inquiry		
	Review, assess, and draw conclusions about hypotheses and theories	
	Analyze arguments, in relation to their premises, assumptions, contexts, and conclusions	
	Construct logical and reasonable arguments that include anticipation of counterarguments	
	Use relevant evidence gathered through accepted scholarly methods and properly acknowledge sources of	
Ethical, Social and Global Awareness		
	Analyze similarities and differences in human experiences and consequent perspectives	
	Examine connections among the world's populations	
	Identify contemporary ethical questions and relevant stakeholder positions	
Scientific, Mathematical and Technological Literacy		
	Demonstrate knowledge of basic principles and concepts of one of the natural sciences	
	Apply methods of scientific inquiry and problem solving to contemporary issues	
	Comprehend and evaluate mathematical and statistical information	
	Perform college-level mathematical operations or apply statistical techniques	
	Describe the potential and the limitations of technology	
	Use appropriate technology to achieve desired outcomes	
Creativity, Innovation and Artistic Literacy		
	Demonstrate creative/innovative approaches to course-based assignments or projects	
	Interpret and evaluate artistic expression considering the cultural context in which it was created	

10.0 **Other relevant information** (such as special classroom, studio, or lab needs, Special scheduling, media requirements, etc.)

10.1 Classroom needs student workstation computers equipped with high-end 3D software and other support software, as appropriate. 10.2 Instructor station needs same software and hardware as student workstations and a projection system with sound.

***Optional course designation; approval request date:** This is the date that the college curriculum committee forwards this course to the appropriate optional course designation curriculum committee for review. The chair of the college curriculum committee is responsible to fill in this date.

****Optional course designation; approval granted date:** This is the date the optional course designation curriculum committee approves a course for the requested optional course designation. The chair of the appropriate optional course designation curriculum committee is responsible to fill in this date.

Appendix B

Enrollment and Market Analysis

APPENDIX B - ENROLLMENT AND MARKET ANALYSIS

Describe and elaborate in Appendix B on the following information:

- **Detailed enrollment projections for the next five years, including as applicable, new students, transfer students, internal transfer students. These projections are to be developed by Enrollment Management and Career Services (EMCS) with an explanation of methodology used. The Vice President for Enrollment Management must formally certify projections in the Concept Paper and Final Program Proposal.**

  The projected enrollment for the first year of the program is expected to be 8 students, growing to a maximum enrollment of 10 students at each year level in the program for a maximum total of 30 students in the program.
  Please refer to page 106 for a chart that details the enrollment projections for the next five years and the formal rationale and projection statements. The IPEDS reporting methodology was used in formulating enrollment projections. Dr. James Miller, Vice President of Enrollment Management and Career Services, has formally certified the projections developed by Scott Hooker, NTID Director of Admissions, and Richard Dirmyer, NTID Director of Institutional Research and Assessment.

- **Anticipated graduation rate (based upon college target and similar RIT programs)**

  The anticipated graduation rate for the 3DGT program is projected to be 70% based on comparison with other NTID programs that have a similar academic profile, such as the NTID Laboratory Science Technology AAS program. See pages 107-110.

- **Competing programs (regional and national) and what RIT's competitive advantage over these programs is.**

  There are no pre-existing AAS degree programs offered in 3D Graphics Technology that serve only Deaf and hard-of-hearing students.

- **Anticipated geographic draw (regional, national and international)**

  The anticipated geographic draw for the 3D Graphics Technology program will be on a national basis. The college of NTID also has students from international enrollment, so there may be some draw from the international pool of students.

- **Program delivery format (full-time, part-time, on-site, off-site, distance learning, weekend learning)**

The 3D Graphics Technology program will be using the full-time, on-site delivery format for its courses.

	Year 1 Internal Transfer	Year 1 Would come to NTID w/o program	Year 1 NEW to NTID	TOTAL	Year 2 Internal Transfer	Year 2 Would come to NTID w/o program	Year 2 NEW to NTID	Persisting	TOTAL	Year 3 Internal Transfer	Year 3 Would come to NTID w/o program	Year 3 NEW to NTID	Persisting	TOTAL	Year 4 Internal Transfer	Year 4 Would come to NTID w/o program	Year 4 NEW to NTID	Persisting	TOTAL	Year 5 Internal Transfer	Year 5 Would come to NTID w/o program	Year 5 NEW to NTID	Persisting	TOTAL
Enrollment Fall Semester	3	1	4	**8**	2	1	6	7	**16**	1	1	8	15	**25**	1	1	8	17	**27**	1	1	8	18	**28**
Enrollment Spring Semester	3	1	4	**8**	2	1	6	7	**16**	1	1	8	8	**18**	1	1	8	9	**19**	1	1	8	9	**19**
Total Semesters of Enrollment	6	2	8	**16**	4	2	12	14	**32**	2	2	16	23	**43**	2	2	16	26	**46**	2	2	16	27	**47**

Assumptions:

We have a few students who have indicated interest in the 3DGT program from existing VCS programs.

SVP normally does not bring in AAS-ready students who have not yet declared a major unless it is for students who are in the Pre-Bacc programs. Given the 3DGT program requires a portfolio review and a fairly rigorous admissions requirements, it is unlikely many students without program affiliation will come from SVP

With years 2 and 3, we expect to see students internally transferring from the VCS department and other NTID departments based on interest and career goals that change over time. The majority of new admissions from year 2- on will be focused on external recruitment and new student groups that normally wouldn't be attending NTID.

Maximum enrollment for the 3DGT program will be 10 students per year level.

This will accommodate current lab space and faculty availability.

3D Graphics Technology Graduation Rate and Rationale prepared by Rich Dirmyer, Director, Institutional Research and Assessment.

As part of the proposed 3D Graphics Technology associate degree program, expected graduation rates were developed considering the following deaf and hard-of-hearing cohorts:

- AAS degree program students
- AAS degree program students, particularly in those programs with articulation agreements with BS degree programs.
- NTID AAS degree program in Lab Science Technology

These three cohorts combine to cover the unique aspects about the proposed program, justifying the expected graduation rates proposed. Each of the three cohorts categorize a relatively small number of students, especially when using the IPEDS methodological approach of defining cohorts of first-time, full-time degree seeking freshmen. In an effort to moderate the observed variation in graduation rates, three-year averages were calculated. Three time intervals were further considered, staggered, specifically six year, seven year, and seven and a half years. These intervals are entirely a function of allowing any student who transfers, prior to completing the associate degree, to five-year programs, a complete 150% of their program's designed length of time to graduate. Otherwise, students remaining in this associate degree program for the academic career will be counted as graduated or not, at seven and a half semesters.

	Graduation Rates (Three Year Weighted Average)		
	Six Year	Seven Year	Seven and a Half Year
AAS Degree Program Students	43.65%	52.37%	42.87%
AAS Degree Program Students w/ Articulation Agreements w/ BS Degree Programs	58.31%	61.88%	54.99%
AAS Degree Program in Lab Science Technology	64.71%	53.33%	62.5%

The staggered nature of these rates can be observed on the following three pages, whereby the seven and half year rates encompass the 2004, 2005, and 2006 cohorts, the seven year rates encompass the 2005, 2006, 2007 rates, so on and so forth. Based on the chart above, focusing specifically on the arts-focused AAS degree program graduation rates, a fair amount of consistency is evident. The AAS degree program rates vary most likely due to the wide range of disciplines included in this group. The AAS degree program rates for those with articulation agreements summarize a small population, and inherently vary.

The AAS degree program in Lab Science Technology becomes particularly of interest, standalone, given the 3D Graphics Technology degree program's similar approach to admitting students. Specifically, the sequencing of first-year courses, and the elevated levels of English and mathematics required, different than other associate degree programs with the exception of Lab Science Technology, have been designed to enhance student

success to superior levels. The required academic background of new students justifies a higher expected graduation rate, similar to that of the AAS degree program in Lab Science Technology. Particular attention is placed upon the recent cohorts of Lab Science Technology AAS students, which can be seen on the last page. With the exception of the fall 2008 cohort, which contained two students, it remains plausible to propose an expected graduation rate of **70%**, to be evaluated on an annual basis:

Fall Cohort	7.5 Year Graduation Rate
2015	70%
2016	70%
2017	70%*
2018	70%*
2019	70%*

*To be reviewed annually.

Deaf/Hard-of-Hearing AAS Student Graduation Rates

	Graduation Rate				
Fall Cohort	Four Years After Entry	Five Years After Entry	Six Years After Entry	Seven Years After Entry	Seven and a Half Years After Entry
2000	30.0	60.0	70.0	70.0	70.0
2001	26.3	36.8	47.4	47.4	47.4
2002	31.6	36.8	42.1	42.1	47.4
2003	17.4	34.8	43.5	43.5	43.5
2004	8.3	33.3	41.7	41.7	41.7
2005	35.7	42.9	50.0	50.0	50.0
2006	12.5	18.8	37.5	37.5	37.5
2007	39.4	57.6	60.6	60.6	
2008	18.2	22.7	22.7		
2009	46.4	60.7			
2010	63.6				

Notes:

Students are categorized based on their major at entry to RIT.

Figures exclude students in international programs (e.g., Kosovo, Croatia).

Students are counted as graduates if they graduate within 150% of their program's length, in alignment with IPEDS reporting requirements.

Deaf/Hard-of-Hearing AAS (w/ Articulations) Graduation Rates

	Graduation Rate				
Fall Cohort	Four Years After Entry	Five Years After Entry	Six Years After Entry	Seven Years After Entry	Seven and a Half Years After Entry
2003	25.0	25.0	50.0	50.0	50.0
2004	100.0	100.0	100.0	100.0	100.0
2005	50.0	50.0	50.0	50.0	50.0
2006	28.6	28.6	57.1	57.1	57.1
2007	60.0	70.0	70.0	70.0	
2008	0.0	0.0	0.0		
2009	57.1	71.4			
2010	100.0				

Notes:

Students are categorized based on their major at entry to RIT.

Figures exclude students in international programs (e.g., Kosovo, Croatia).

Students are counted as graduates if they graduate within 150% of their program's length, in alignment with IPEDS reporting requirements.

Deaf/Hard-of-Hearing AAS (Lab Science Technology) Graduation Rates

	Graduation Rate				
Fall Cohort	Four Years After Entry	Five Years After Entry	Six Years After Entry	Seven Years After Entry	Seven and a Half Years After Entry
2003	33.3	33.3	66.7	66.7	66.7
2005	50.0	50.0	50.0	50.0	50.0
2006	20.0	20.0	40.0	40.0	40.0
2007	85.7	85.7	85.7	85.7	
2008	0.0	0.0	0.0		
2009	57.1	71.4			
2010	100.0				

Notes:

Students are categorized based on their major at entry to RIT.

Figures exclude students in international programs (e.g., Kosovo, Croatia).

Students are counted as graduates if they graduate within 150% of their program's length, in alignment with IPEDS reporting requirements.

Appendix C

Internal Letters of Support

Section 1

- NTID Department of Science and Mathematics
- Wallace Library
- Access Services
- College of Liberal Arts

R·I·T

Rochester Institute of Technology

National Technical Institute for the Deaf
Department of Science and Mathematics
Lyndon Baines Johnson Building
52 Lomb Memorial Drive
Rochester, NY 14623-5604
585-475-6478

September 17, 2014

The NTID Department of Science and Mathematics is pleased to support the proposal for the 3D Graphics Technology AAS program. In order to partially fulfill general education requirements, students who pursue this degree will be required to take one NTID mathematics course at the NMTH 120 level or higher as well as one NTID science course at the NSCI 120 level or higher. These courses will be offered using resources from my department.

The impact on my departmental for providing the math and science courses for students in this major is expected to be minimal. There is no single math course that students in this program must take. Instead, students will take the course that they test into upon their arrival at NTID, so they will likely be spread across the range of courses that we provide. Further, given that the proposed program schedule places the mathematics course in the spring semester, which is when fewer NTID students enroll in a math class, our having to provide math courses for these students will help us to balance our instructional load across the academic year and will allow us to use existing faculty and other resources. As for our general education science offerings, I do not anticipate that students in the 3D Graphics Technology program will create an added burden either. My department tends to offer three 100-level NSCI courses in subjects such as astronomy, environmental science, biological studies, and forensics each semester. Given that I am able to assign faculty to direct instructional and/or tutoring workloads on an as-needed basis, that the students admitted to this program are not expected to drastically increase the number of students enrolled in our courses, and that students can take a general education science course as they can fit it into their schedule during the five semesters of the program, I feel that we will be able to accommodate these students within our current resources.

Sincerely,

Matthew A. Lynn, Ph.D.
Interim Department Chair and Associate Professor, Chemistry

The Wallace Center at RIT

Memorandum

TO: Kurt Stoskopf, Associate Degree Program Coordinator, Visual Communications Studies
Heather Smith, Instructional/Support Faculty, Visual Communications Studies

CC: Shirley Bower, Director, RIT Libraries
Sheila Smokey, Manager, Acquisitions & Serials

FROM: Joan Naturale, NTID Librarian, RIT Libraries

DATE: September 4, 2014

RE: Library support for proposed 3D Graphics AAS Program

The following outlines the impact of NTID's Department of Arts and Imaging/Visual Communications Studies proposed AAS degree program in 3D Graphics.

This program will have a minimal impact on the library's services and collection of books, journals, and databases.

RIT Libraries now use a demand/user-driven model of acquisition for the majority of its book purchases ensuring books purchased are those that users want.

Our current holdings (journals and databases) are at acceptable levels for associates' level programs. This is based on requests for books not published yet and new journal titles.

The Wallace library's **Imaging Arts & Science collection of journals, books and databases**, supports the associate degree programs for the technical and artistic aspects of 3D Digital Design.

The library subscribes to **standard core collections** of digital arts and computer graphics **databases, books and journals** by professional associations and publishers for example, ACM Digital Library, Art FullText, Arts and Humanities Full Text, and ARTstor. We subscribe to journals such as ACM (Association of Computing Machinery) Transactions on Graphics, Computer Aided Geometric Design, Computer Arts, Computer Graphics, Computer Graphics Forum, Computer Graphics World, Computers and Graphics, IEEE (Institute of Electrical and Electronic Engineers) Computer Graphics and Applications, Leonardo, and SIGGRAPH Video Review. The library guide created by Kari Horowicz, the Imaging and Arts Librarian supplies links to the books, databases, and journals. http://infoguides.rit.edu/3ddigital

The Wallace library is a member of the Rochester Regional Library Council (RRLC), which provides RIT students, researchers, and faculty access to materials at other Monroe County libraries, using free **RRLC Library access cards**. Requested journal articles and books not owned by the Wallace Library will be obtained on a timely basis through the library's **interlibrary loan and document delivery services (IDS)** and **ConnectNY**.

Memo of Support from Access Services

The AAS proposal in 3D Graphics Technology would be very efficiently served by Access Services. As you know, writing courses are normally taught by NTID faculty without use of access services. The remaining 12 credits of 'perspectives courses' would be require little additional resources to support because these classes are heavily enrolled by deaf students already. Added students would most often be served within existing supported sections of these lower division classes. Lower division courses are generally larger and hold higher numbers of deaf students, making them a relatively good bargain for service efficiency.

The perspective courses students take would apply within the proposed AAS degree and fill requirements for those students who move on to BS or BFA level programs at RIT. With increasing enrollments in RIT sections DAS will see a small increase in resource requirements but this is impossible to quantify. We have been seeing slow, consistent growth over our entire history mapped to the increasing success of NTID-supported students in RIT majors. This proposal would fit comfortably within that trend.

We certainly support increased opportunities for deaf students to undertake studies in new areas, especially when the curriculum design does not place extraordinary burdens on Access Services. Having deaf students in NTID programs become acquainted with requesting and effectively using access services while in their AAS program seems a great way to prepare them for higher levels of study at RIT should they choose to pursue that option.

Steve

Stephen A. Nelson
Director of Operations, Access Services
National Technical Institute for the Deaf

(585) 475-6455 (office)
(585) 797-4007 (cell)
Steve.Nelson@rit.edu

R·I·T

Rochester Institute of Technology

College of Liberal Arts
92 Lomb Memorial Drive
Rochester, New York 14623-5604
585-475-2444 FAX:585-475-7120

February 23, 2015

Dr. Stephen Aldersley
Associate Vice President
for Academic Affairs
NTID

Dear Dr. Aldersley,

It is my pleasure to write in support of the Associate in Applied Science degree in 3D Graphics Technology proposed by NTID's Visual Communications Studies Department.

I am happy to support the program based on our longstanding partnership on other programs, and the impressive proposal you forwarded me, which highlights your strengths in visual communications education, and the College of Liberal Arts offerings to your students in the area of liberal arts foundations and perspectives.

We look forward to welcoming your incoming students into the perspective and foundational courses you have identified in the course mask.

In sum, I endorse the proposal without reservation, and look forward to working with you on realizing the program.

Best of luck in the next steps of this process.

Sincerely,

James J. Winebrake, PhD.
Dean, College of Liberal Arts

Appendix C

Internal Letters of Support

Section 2

Program Space Sharing Agreement

Program Space Sharing Agreement

September 4, 2014

This letter will serve as a document of agreement for the purposes of sharing space between programs within the Visual Communications Studies department. Currently the Visual Communications Studies department has one program, Arts and Imaging Studies, which provides courses of study for students in the Graphic Design, Photo Imaging, Web Design and Print Publishing areas. When reviewing the needs and expectations within the Visual Communications industries, the department decided, based on perceived and anticipated need for graduates who possess skills in the creation and design of 3D graphics, to create a new program that serves the need of this segment of the Visual Communication industry.

With the creation of the new 3D Graphics Technology program within the Visual Communications Studies department, it becomes necessary for the new program to share computer lab and classroom space with the existing Arts and Imaging Studies program. After careful analysis of the existing Visual Communications Studies classroom and computer lab spaces in Booth Hall, rooms 1510, 1515, 1470, 1516, A321, A311, and A313, the two programs have agreed, *at a minimum*, to share these spaces:

- **Booth 1470 classroom** for two courses that will share enrollment from the students in the Arts and Imaging Studies program (one scheduling block for Fall and Spring semesters),
- **Booth A321 -or- in Booth 1510/1515 classroom** for a shared course with the students in the Arts and Imaging Studies program (one scheduling block for Fall semester),
- **Booth A311 classroom** for the 3D Graphics Technology program courses (two to three classroom scheduling blocks each semester).
- **Offices for faculty associated with the 3D Graphics Technology program** will be used from the existing block of faculty offices assigned to the Visual Communications Studies department.

It is understood by both programs that usage of the classrooms and computer labs may change based on enrollment numbers of the two programs within the Visual Communications Studies department each academic year. This document establishes the *minimum* classroom spaces that will be made available for the 3D Graphics Technology program for course planning and scheduling purposes now and in the future.

Ken Hoffmann
Chairperson,
Visual Communications Studies Department

Appendix D

Program Need and Marketability

Provide documentation from potential feeder schools, employers and directors of advanced educational programs in Appendix D to demonstrate the need and marketability of this program. In particular:

- **Include analysis from RIT's office of Cooperative Education and Career Services that addresses the opportunity for CO-OP placement, permanent job placement and graduate school admission.**

The NTID Center on Employment director, John Macko, wrote in his letter of support for the 3D Graphics Technology program that the NCE is in agreement with the program proposal. He says, "The 3D Computer Graphics Technology program will enhance NCE's opportunity to attract employers seeking our students and graduates for both co-op and full-time positions."

- **Indicate the basis upon which individuals were selected to prepare external letters of support. Important qualifications include academic background, subject matter expertise, relevant hiring responsibility, involvement in acceptance of students to advanced programs, etc.**

We are including four external letters of support from companies selected because of their areas of expertise and their familiarity with working with deaf employees: Camber Corporation, Bryant Design Studios, Walt Disney Company, and SEI Design Group. We selected these companies because they represent various aspects of the 3D Graphics Industry. Camber Corporation focuses on Simulation development and developing training materials for the Department of Defense and is a corporation that has deaf employees and is aware of the communication needs and potential that they can offer the company. Camber uses 3D graphics extensively in their simulation software and uses it to provide the realism necessary for simulated training.

The two architectural design firms, SEI Design Group and Bryant Design Studio, use 3D graphics for the architectural visualization of CAD floor plans and providing virtual client walkthroughs of proposed architectural designs. They state that there is a growing need for workers with 3D modeling skills and visual presentation design. Both firms have experience working with deaf employees and clients, and so were identified for support.

We contacted an alumnus from the VCS program who works at the Walt Disney Company, as a designer in the Disney Consumer Products department. Andreas is responsible for many aspects of design for the commercial components of Disney, and is also active in advocating for hires from NTID and RIT.

Please refer to pages 120-124 for the letters of support we have received.

R·I·T

Rochester Institute of Technology
National Technical Institute for the Deaf
Center on Employment
52 Lomb Memorial Drive
Rochester, NY 14623-5604
585-475-6219
585-475-7570 fax
www.rit.edu/ntid/coops/jobs

October 28, 2014

Mr. Kurt Stoskopf
Rochester Institute of Technology
National Technical Institute for the Deaf
Visual Communication Studies Department

Dear Mr. Stoskopf:

I have reviewed your department's proposal to establish the new Associate of Applied Science (AAS) in 3D Computer Graphics Technology program. The NTID Center on Employment (NCE) is in agreement with this proposal.

With the ever changing nature of the visual communication world, it is important that NTID Technical programs keep pace with what employers are seeking in skill level of college graduates. The 3D Computer Graphics Technology program will enhance NCE's opportunity to attract employers seeking our students and graduates for both co-op and full-time positions.

In addition, we are finding that more students considering NTID for their college degree are expecting to subsequently graduate with a BS degree. With a certain percentage of these students not fully academically ready for the BS level, the AAS degree program will allow them to strengthen their skills and be better prepared in two years to move into the BS degree programs.

NCE has continuously developed good working relationships with faculty from the Visual Communication Studies department, so we are fully prepared to assist the students as they complete the AAS degree and work with them as they seek entry level jobs or they enter their BS degree program.

We look forward to working with the Visual Communication Studies department on this new AAS degree program.

Sincerely,

John Macko
Director, NCE

BRYANT
DESIGN
STUDIOS

42 Lanark Crescent
Rochester, NY 14609
Phone 585.734.8852
info@bryantdesignstudios.com
BryantDesignStudios.com

Dear members of the RIT curriculum committees,

Bryant Design Studios is a company that specializes in architectural and product visualization. We help visionaries in the world, such as architects, developers, inventors and artist, visualize their dreams high quality 3D images, animation and virtual reality. We are writing this letter to express our support for the NTID Visual Communications Department's 3D Graphics Technology program proposal. After reviewing the provided program descriptions, curriculum, and with conversations with the faculty, we have determined that the 3D Graphics Technology program will provide students with a strong foundation of knowledge that would qualify students for entry level jobs in the architectural, gaming and movie industries. We support the Visual Communications Studies department's efforts in establishing this as a full program at the National Technical Institute for the Deaf.

These courses, in particular, will serve students well for seeking employment in our industry:

- N3DG-100 Design Drawing
- N3DG-140 3D Lighting & Materials
- N3DG-210 Advanced 3D Modeling & Techniques
- N3DG-220 Principles of 4D Design

Students with experience with these courses and with the software taught in the program, specifically in using Autodesk 3D Max, Maya and Final Cut Pro, would be considered employable at our organization, and in other organizations in the same industry. In the 3D Visualization industry, the job market is competitive for jobs at this level, but we predict that the five-year employment outlook for graduates from this program is excellent due to the growing need for and popularity of 3D computer graphics.

Michael Bryant
President & Creative Director
Bryant Design Studios

Dear members of the RIT curriculum committees,

Camber Corporation is a company that provides engineering and technical services, cyber operations technology, mission critical support services, and advanced training solutions to US federal agencies and affiliates. We are writing this letter to express our support for the NTID Visual Communications Department's 3D Graphics Technology program proposal. Upon review of the provided program description, curriculum, along with conversations with the faculty, we have determined that the 3D Graphics Technology program will provide students with a strong foundation of knowledge that would qualify students for entry level jobs in the Department of Defense (DoD).

These courses, in particular, will serve students well for seeking employment in our industry:

- NGGT-210 Advanced 3D Techniques
- NGGT-225 3D Motion
- NGGT-260 Professional Practices

Students with experience with these courses and with the software taught in the program, specifically in using Maya 2014, 3DS Max, Lightwave, Z Brush, and Photoshop CC 2014, would be considered employable in our organization, as well as in other organizations in the same industry. With DoD contracting work the job market is competitive. We predict that the five-year employment outlook for graduates from this program is stable at best because of Navy sequestration and reduced military spending that has come from it.

We support the Visual Communications Studies department's efforts in establishing this as a full program at the National Technical Institute for the Deaf.

Oliver Manuel

Project Lead
Camber Corporation

Disney Consumer Products

Monday, November 16, 2015

Dear RIT Curriculum Committee Members,

Disney Consumer Products is the business segment of The Walt Disney Company and its affiliates that delivers innovative and engaging product and merchandise experiences across thousands of categories from toys and apparel, to books and fine art, across our various brands. We are writing this letter to express our support for the NTID Visual Communications Department's 3D Graphics Technology program proposal. Upon review of the proposed program description and curriculum, along with conversations with the faculty, we have determined that the 3D Graphics Technology program will provide students with a strong foundation of knowledge that would qualify students for entry level jobs in the entertainment industry.

These courses, in particular, will serve students well for seeking employment in our industry:

- Intermediate and Advanced 3D Modeling & Techniques
- 3D Lighting & Materials
- 3D Printing

Students with experience in these courses and with the software taught in the program, specifically in using ZBrush and Maya (program most widely used by film, television and consumer products in North America), would be considered employable in our company, as well as in other organizations in the same industry. In the entertainment industry, the job market is competitive for jobs at this level, but we believe graduates from this program would be well-prepared and could position themselves as strong candidates who can demonstrate the necessary talent and appropriate skills in their portfolio.

We support the Visual Communications Studies department's efforts in establishing this as a full program at the National Technical Institute for the Deaf.

Andreas Wezel-Peterson

Communications Designer
Disney Consumer Products

1101 Flower Street / Glendale, California 91201 / 818-544-0000

SEI design group
ARCHITECTURE • PLANNING • CONSULTING

Rochester Institute of Technology
One Lomb Memorial Drive
Rochester, NY 14623

August 20, 2015

Members of the RIT Curriculum Committee,

I am a principal at SEI Design Group, a company that provides architectural design, planning and consultation services in a large portion of territory in New York State. I am writing this letter in support of the proposed 3D Graphics Technology program in NTID's Visual Communications Department.

Upon review of the provided program description, curriculum, along with conversation with faculty, I believe the proposed program has every ability to prepare students for entry level jobs in three dimensional visualization aspects of the Architectural profession.

These course, in particular, will serve students well for seeking employment in our industry:
a. Three dimensional modeling sequence
b. Three dimensional lighting and materials
c. Professional practice

Students equipped with experience from these courses and knowledge of the software taught in the program (specifically 3D modeling), would be considered highly employable in our industry. The Architectural job market is competitive, but the near term outlook for employment opportunities for graduates from this program is excellent.

I support the Visual Communications Studies Department's efforts in establishing this as a full program at the National Technical Institute for the Deaf.

Respectfully,

Glan-Paul Riane, AIA
Principal

224 Mill Street
Rochester, NY 14614
p 585.442.7010
f 585.442.7019

187 Wolf Rd., Suite 304
Albany, NY 12205
p 518.435.2467
f 518.435.2469

Appendix E

Space Allocation Request Form

<Not Used>

Appendix F

Full Faculty Curriculum Vitae

Appendix G

Cost model: revenue/cost projections/expenses