## COMPUTER ANIMATION AND GAME DEVELOPMENT (CAGD)

See Course Description Symbols and Terms (https://catalog.csuchico.edu/academic-standards-policies/course-description-symbols-terms/) for an explanation of course description terminology and symbols, the course numbering system, and course credit units.

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<td>Computer-Assisted Art I</td>
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<td>CAGD 112</td>
<td>Virtual and Physical Cameras Applications</td>
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<td>CAGD 117</td>
<td>Concept Design and Storyboarding</td>
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<td>Fall and spring</td>
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<td>You may take this course for a maximum of 3 units</td>
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<td>CAGD 170</td>
<td>Video Game Design</td>
<td>3</td>
<td></td>
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<td>Graded</td>
<td>You may take this course for a maximum of 3 units</td>
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<td>Scripting and Programming for Computer Graphics</td>
<td>3</td>
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<td>GE Critical Thinking (A3), GE Mathematics/Quantitative Reasoning (A4).</td>
<td>Fall and spring</td>
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<td>You may take this course for a maximum of 3 units</td>
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<td>CAGD 189</td>
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<td>You may take this course for a maximum of 15 units</td>
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<td>You may take this course more than once</td>
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<td>Department permission.</td>
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<td>Graded</td>
<td>You may take this course for a maximum of 15 units</td>
<td>Lower Division</td>
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<tr>
<td>CAGD 230</td>
<td>Digital Modeling</td>
<td>3</td>
<td>Arts (C1), GE Mathematics/Quantitative Reasoning (A4).</td>
<td>CAGD 112 with a grade of C- or higher.</td>
<td>Fall and spring</td>
<td>Graded</td>
<td>You may take this course for a maximum of 3 units</td>
<td>Lower Division; Laptop required</td>
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</table>
CAGD 240 Digital Animation 3 Units
Prerequisite: CAGD 110 with a grade of C- or higher.
Typically Offered: Fall and spring
This course explores the basic principles and techniques of motion such as in-betweening, timing, squash and stretch, and more. Students produce animated works that demonstrate these principles and techniques and that effectively communicate with the audience. 2 hours activity, 2 hours lecture. (020240)
Grade Basis: Graded
Repeatability: You may take this course for a maximum of 3 units
Course Attributes: Lower Division; Laptop required

CAGD 250 Introduction to Technical CGI 3 Units
Prerequisite: CAGD 117 and CAGD 230 all with a grade of C- or higher.
Typically Offered: Fall and spring
This course provides an introduction and technical foundation to tools and strategies used to develop both pre-visualized and final deliverables leading to effective visual communication as it relates to digital production in the game and animation industries. Emphasis is placed on the basics of compositing techniques and components of 3D pre-visualization. 2 hours activity, 2 hours lecture. (022151)
Grade Basis: Graded
Repeatability: You may take this course for a maximum of 3 units
Course Attributes: Lower Division; Laptop required

CAGD 270 Level Design 3 Units
Prerequisite: CAGD 170 with a grade of C- or higher.
Typically Offered: Fall and spring
This project-oriented course introduces the concepts and tools used in creating levels for games. Fundamental architectural theory, critical path, flow, pacing, dilemma, balancing, difficulty level, playtesting, and storytelling relating to level design are studied. Existing game levels are studied and analyzed; original game levels are created using industry tools to meet game design objectives. Understanding how level design fits into the production pipeline and how to work in collaborative environments. 2 hours activity, 2 hours discussion. (021350)
Grade Basis: Graded
Repeatability: You may take this course for a maximum of 3 units
Course Attributes: Lower Division; Laptop required

CAGD 280 Introduction to Game Scripting 3 Units
Prerequisite: CAGD 180 or CSCI 111 all with a grade of C- or higher.
Typically Offered: Fall and spring
The course covers an introduction to game scripting concepts and will take the student through the process of creating prototypes and games using an industry-standard game engine. The course will explore using a game engine and associated scripting to maneuver characters around in 2D/3D space, develop interactive game environments, implement special effects, manipulate objects, script menus and graphical user interfaces, create non-player character behaviors, and much more. The student is required to have basic programming skills and game design experience from which the course will expand in using scripting and a game engine to create effective games. 2 hours activity, 2 hours lecture. (022150)
Grade Basis: Graded
Repeatability: You may take this course for a maximum of 3 units
Course Attributes: Lower Division; Laptop required

CAGD 289 Industry Internship 1-3 Units
Typically Offered: Fall and spring
0 hours supervision. (020126)
Grade Basis: Credit/No Credit
Repeatability: You may take this course for a maximum of 15 units
Course Attributes: Lower Division

CAGD 298 Special Topics 1-3 Units
Typically Offered: Fall and spring
0 hours lecture. (020131)
Grade Basis: Graded
Repeatability: You may take this course more than once
Course Attributes: Lower Division

CAGD 299 Special Problems 1-3 Units
Prerequisite: Faculty permission.
Typically Offered: Fall and spring
This course is an independent study of special problems offered for 1.0-3.0 units. You must register directly with a supervising faculty member. 0 hours supervision. (020134)
Grade Basis: Credit/No Credit
Repeatability: You may take this course for a maximum of 6 units
Course Attributes: Lower Division

CAGD 320 Digital Texturing 3 Units
Prerequisite: CAGD 230 with a grade of C- or higher.
Typically Offered: Fall and spring
This course explores the concepts, principles, practices, tools, and techniques of UV layout for 3D models and the digital texturing process. Topics include UV layout, material creation, texture painting and baking, level of detail, and import/export of final content into various media formats. Students demonstrate the concepts, principles, workflow and techniques as part of the texturing pipeline associated with industry standard practices. 2 hours activity, 2 hours discussion. (021903)
Grade Basis: Graded
Repeatability: You may take this course for a maximum of 3 units
Course Attributes: Upper Division; Laptop required

CAGD 325 Motion Capture 3 Units
Prerequisite: CAGD 230 with a grade of C- or higher.
Typically Offered: Fall and spring
This course provides students an understanding and a practical application of motion capture technology used for game, virtual reality (VR), film and simulations. It provides students with fundamental skills in the use and aesthetics of motion capture. Students gain practical experience in calibrating and operating a motion capture system, and in planning and implementing a motion capture shoot. Students also gain an overview of the broader context of motion capture such as its use in computer generated imagery (CGI), animation, game development, and interactive performance. 2 hours activity, 2 hours lecture. (021778)
Grade Basis: Graded
Repeatability: You may take this course for a maximum of 3 units
Course Attributes: Upper Division; Laptop required

CAGD 330 3-D Computer Modeling 3 Units
Prerequisite: CAGD 320 with a grade of C- or higher.
Typically Offered: Fall only
This course uses 3-D modeling and animation software in developing 3-D computer models and creating presentations of those models in storytelling still scenes. The tools, techniques, and topics studied include basic and advanced 3-D modeling tools, 3-D scene layout, lighting, texturing, and rendering. 4 hours activity, 1 hour discussion. (002317)
Grade Basis: Graded
Repeatability: You may take this course for a maximum of 3 units
Course Attributes: Upper Division; Laptop required
CAGD 331 3-D Character Modeling 3 Units
Prerequisite: CAGD 330 with a grade of C- or higher.
Typically Offered: Spring only
A study of the necessary principles and techniques of creating digital 3-D characters. Students learn the necessary skills for modeling characters, creating effective anatomy, and rigging characters for animation purposes. 4 hours activity, 1 hour lecture. (020241)
Grade Basis: Graded
Repeatability: You may take this course for a maximum of 3 units
Course Attributes: Upper Division; Laptop required

CAGD 340 Computer Animation 3 Units
Prerequisite: CAGD 240 with a grade of C- or higher.
Typically Offered: Fall and spring
The concepts of computer imaging and animation are taught in this project-based course. Focus is on the principles of animation and how they apply to current computer animation techniques. This course emphasizes both creative and technical skills. 2 hours activity, 2 hours lecture. (002366)
Grade Basis: Graded
Repeatability: You may take this course for a maximum of 3 units
Course Attributes: Upper Division

CAGD 345W Advanced Animation Pre-Production and Story Development (W) 3 Units W, GW
Prerequisite: GE Written Communication (A2) requirement, CAGD 117 with a grade of C- or higher.
Typically Offered: Fall and spring
Concentration on story development as it directly relates to Computer Animation. Students write a treatment, script, and storyboard for an animation project. Emphasis is placed on understanding the story structure, writing interesting dialogue and developing an in-depth storyboard. The course gives students a practical approach to creating the pre-production component of an animated "short." 3 hours lecture. (015871)
Grade Basis: Graded
Repeatability: You may take this course for a maximum of 3 units
Course Attributes: Upper Division; Writing Course; Graduation Writing Assessment

CAGD 350 3D Scanning 3 Units
Prerequisite: CAGD 320 with a grade of C- or higher.
Typically Offered: Fall and spring
This course provides an introduction and technical foundation to tools and strategies used to develop 3D scanned content and deliverables leading to effective visual communication as it relates to digital production in the game and animation industries. Emphasis is placed on the basics of scanning theory, hardware uses and limitations, safety, digital capture and pipeline development. 2 hours activity, 2 hours lecture. (021966)
Grade Basis: Graded
Repeatability: You may take this course for a maximum of 3 units
Course Attributes: Upper Division; Laptop required

CAGD 358 Emerging Technologies in Media and Entertainment 3 Units
Prerequisite: CAGD 112, CAGD 180 for CAGD majors; JOUR 255 or 255W, JOUR 260W for JOUR majors; MADT 206 for MADT majors.
Typically Offered: Fall only
This professional skills and technology course teaches students in media, entertainment, and technology fields about new and emerging trends in media and entertainment technologies, including, but not limited to, Virtual Reality, Augmented Reality, Photogrammetry, LiDAR scanning, 360 degree photo-scanning, and Motion Capture. The course is focused on the exploration of emerging technologies, as it applies to the various industries in media and entertainment, including, but not limited to, journalism, storytelling, and game development. 3 hours discussion. (021966)
Cross listing(s): JOUR 358, MADT 358
Grade Basis: Graded
Repeatability: You may take this course for a maximum of 3 units
Course Attributes: Upper Division

CAGD 370 Video Game Development 3 Units
Prerequisite: CAGD 270, CAGD 280 both with a grade of C- or higher.
Typically Offered: Fall and spring
This course covers the principles of game design, gaming strategies, game production, and marketing. Students learn to function as a productive member of an interdisciplinary game design team to plan, document, and develop a video game concept. 2 hours activity, 2 hours lecture. (020242)
Grade Basis: Graded
Repeatability: You may take this course for a maximum of 3 units
Course Attributes: Upper Division; Laptop required

CAGD 373 Game Asset Production 3 Units
Prerequisite: CAGD 320 with a grade of C- or higher.
Typically Offered: Fall and spring
This course explores the basic concepts, principles, practices, tools and techniques of game asset production and the production pipeline used primarily in games and interactive environments. Topics include creating, modifying, texturing, lighting, and rendering environmental and prop assets across a variety of media. Projects are designed to guide students through the process of designing digital assets and understanding how objects are important and used in games and interactive environments. Students produce game assets that demonstrate the concepts, principles, workflows, and techniques associated with game asset production. 2 hours activity, 2 hours lecture. (021633)
Grade Basis: Graded
Repeatability: You may take this course for a maximum of 3 units
Course Attributes: Upper Division; Laptop required

CAGD 374W Interactive Storytelling in Video Games 3 Units W
Prerequisite: CAGD 345W or CAGD 370 (with a grade C- or higher).
Typically Offered: Fall and spring
This course examines video games as a storytelling medium, investigating how interactive storytelling incorporating rich characters and stories that incite an immersive experience, requires approaches to writing that may be linear or nonlinear. Students will delve into the evolution of narrative in video games along with the iterative process of writing for video games and examine the critical component of a unified experience between writer and level designer. Students will engage in the elements of narrative for video games through investigation, analysis, and design. 2 hours activity, 2 hours discussion. (022152)
Grade Basis: Graded
Repeatability: You may take this course for a maximum of 3 units
Course Attributes: Upper Division; Laptop required; Writing Course
CAGD 375W Video Game Pre-Production  3 Units  W, GW
Prerequisite: GE Written Communication (A2) requirement; CAGD 370 (with a grade C- or higher).
Typically Offered: Fall and spring
An intermediary course studying the video game pre-production and development process. This course covers the software and production processes used within the video game development industry. Emphasis is placed on game documentation, team communications, and understanding Agile production processes. The course gives students a practical approach to creating the pre-production elements of a video game. 3 hours lecture. (022194)
Grade Basis: Graded
Repeatability: You may take this course for a maximum of 3 units
Course Attributes: Upper Division; Laptop required; Writing Course; Graduation Writing Assessment

CAGD 377 Mobile Game Development  3 Units
Prerequisite: CAGD 370 with a grade of C- or higher.
Typically Offered: Fall and spring
This course investigates the evolution of mobile gaming and the challenges for developing mobile games such as game design, art, programming, distribution, marketing, and monetization are examined. The phases in mobile game development and various roles in a development project are explored. Existing and planned mobile games are analyzed. The process of planning, designing, implementing, and producing mobile games on various architectures are also investigated. Throughout the course, game concepts and proposals are created for analysis with promising proposals moving on to planning, design, implementation, and development. 2 hours activity, 2 hours discussion. (021444)
Grade Basis: Graded
Repeatability: You may take this course for a maximum of 3 units
Course Attributes: Upper Division; Laptop required

CAGD 380 Game Scripting  3 Units
Prerequisite: CAGD 280 (with a grade of C- or higher) or CSCI 211 (with a grade of C- or higher).
Typically Offered: Spring only
This course covers an introduction to game scripting and takes the student through the process of creating games using an industry-standard game engine. The course explores using a game engine and associated scripting to maneuver characters around in 3D space, develop game environments, implement special effects, manipulate objects, script menus and graphical user interfaces, create non-player character behaviors, and much more. The student is required to have basic programming skills and game design experience from which this course expands in using scripting and game engine to create effective games. 2 hours activity, 2 hours lecture. (021604)
Grade Basis: Graded
Repeatability: You may take this course for a maximum of 3 units
Course Attributes: Upper Division; Laptop required

CAGD 389 Industry Internship  1-3 Units
Prerequisite: Faculty permission.
Typically Offered: Fall and spring
This internship is offered for 1.0-3.0 units. Students must register directly with a supervising faculty member. 0 hours supervision. (020127)
Grade Basis: Credit/No Credit
Repeatability: You may take this course for a maximum of 15 units
Course Attributes: Upper Division

CAGD 397 3-D Character Animation  3 Units
Prerequisite: CAGD 330 (with a grade of C- or higher) or CAGD 340 (with a grade of C- or higher).
Typically Offered: Fall and spring
This course covers the study of motion, timing and acting as they apply to animated characters. Emphasis is on the performance of the character and how it reads to the audience. Techniques and methods for facial expressing, lip-synching, and staging are explored. 2 hours activity, 2 hours discussion. (021225)
Grade Basis: Graded
Repeatability: You may take this course for a maximum of 3 units
Course Attributes: Upper Division; Laptop required

CAGD 398 Special Topics  1-3 Units
Typically Offered: Fall and spring
This course is for special topics offered for 1.0-3.0 units. Typically the topic is offered on a one-time-only basis and may vary from term to term and be different for different sections. See the Class Schedule for the specific topic being offered. 3 hours lecture. (015892)
Grade Basis: Graded
Repeatability: You may take this course more than once
Course Attributes: Upper Division

CAGD 399 Special Problems  1-3 Units
Prerequisite: Faculty permission.
Typically Offered: Fall and spring
This course is an independent study offered for 1.0-3.0 units. You must register directly with a supervising faculty member. 0 hours supervision. (020135)
Grade Basis: Credit/No Credit
Repeatability: You may take this course for a maximum of 6 units
Course Attributes: Upper Division

CAGD 420 Digital Lighting and Texturing  3 Units
Prerequisite: CAGD 330 with a grade of C- or higher.
Typically Offered: Fall only
This course explores the techniques used for simulating realistic lighting and texturing in 2D and 3D environments and develops student skills in accurate image creation. 2 hours activity, 2 hours lecture. (020243)
Grade Basis: Graded
Repeatability: You may take this course for a maximum of 3 units
Course Attributes: Upper Division; Laptop required

CAGD 432 3-D Character Rigging  3 Units
Prerequisite: CAGD 330 (with a grade of C- or higher) or CAGD 340 (with a grade of C- or higher).
Typically Offered: Spring only
This course explains the technical skills and challenges of rigging for 3-D animation. Students develop key technical skills for 3-D character setup including how to build, rig, skin, pose, and test 3-D models for animation. Students explore the process of creating joints, assembling skeletons, fine-tuning rigs for realistic motion, rigging bodies and faces, and techniques for binding surfaces to skeletal rigs for animation. 2 hours activity, 2 hours discussion. (021225)
Grade Basis: Graded
Repeatability: You may take this course for a maximum of 3 units
Course Attributes: Upper Division; Laptop required

CAGD 441 3-D Character Animation  3 Units
Prerequisite: CAGD 340 with a grade of C- or higher.
Typically Offered: Fall and spring
This course covers the study of motion, timing and acting as they apply to animated characters. Emphasis is on the performance of the character and how it reads to the audience. Techniques and methods for facial expressing, lip-synching, and staging are explored. 2 hours activity, 2 hours lecture. (020248)
Grade Basis: Graded
Repeatability: You may take this course for a maximum of 3 units
Course Attributes: Upper Division; Laptop required
CAGD 445  Advanced Animation Production  3 Units
Prerequisite: CAGD 330 or CAGD 340, CAGD 345W.
Typically Offered: Fall only
The computer animation production process is taught in this class. Working from a script, storyboard, and/or animatic, students complete an "animated short" with accompanying sound, music, and visual effects. Emphasis is on working as a member of a computer animation team, similar to a real-world production facility. 3 hours discussion.  (002367)
Grade Basis: Graded
Repeatability: You may take this course for a maximum of 3 units
Course Attributes: Upper Division

CAGD 458  Applied Emerging Technologies in Media and Entertainment  3 Units
Prerequisite: CAGD 112, CAGD 180 for CAGD majors; JOUR 255 or JOUR 255W, JOUR 260W for JOUR majors; MADT 206 for MADT majors.
Typically Offered: Spring only
This professional skills and technology project-based course engages students in new and emerging technologies in media and entertainment through applied projects requiring students to work in multidisciplinary teams to create completed visual content projects. The course is focused on the application of new and emerging technologies with relevance in various media and entertainment industries, including, but not limited to, journalism, storytelling, and game development. 3 hours discussion.  (021969)
Cross listing(s): JOUR 458, MADT 458
Grade Basis: Graded
Repeatability: You may take this course for a maximum of 3 units
Course Attributes: Upper Division

CAGD 470  Video Game Production  3 Units
Prerequisite: CAGD 375W (with a grade of C- or higher); CAGD 373 (with a grade of C- or higher) for CAGD majors only.
Typically Offered: Fall and spring
Using the principles of game design, students work in collaborative teams to design, implement, test, and produce a computer game. Marketing strategies are also explored. 4 hours activity, 1 hour lecture.  (020246)
Grade Basis: Graded
Repeatability: You may take this course for a maximum of 3 units
Course Attributes: Upper Division; Laptop required

CAGD 489  Industry Internship  1-3 Units
Typically Offered: Fall and spring
0 hours supervision.  (020128)
Grade Basis: Credit/No Credit
Repeatability: You may take this course for a maximum of 15 units
Course Attributes: Upper Division

CAGD 493  Senior Portfolio  3 Units
Prerequisite: CAGD 330 or CAGD 340, CAGD 345W.
Typically Offered: Fall and spring
This course affords senior level students the opportunity to develop work for a professional-quality portfolio through directed senior-level projects demonstrating their creativity, and acquired aesthetic and technical skills in their area of study. Projects are selected by negotiation starting with a specific written proposal and plan. The course utilizes the process of preparing and deploying a professional portfolio to incorporate these new works and refined selections of prior works. The course also addresses self-promotional strategies and successful work practices of industry professionals. Students are required to formally present the portfolio. Class time will be a mix of lecture, discussion, presentation, critique, meetings, and activities. 3 hours discussion.  (021424)
Grade Basis: Graded
Repeatability: You may take this course for a maximum of 6 units
Course Attributes: Upper Division

CAGD 495  Advanced Production  3 Units
Prerequisite: Faculty permission.
Typically Offered: Fall and spring
This course is designed to give hands-on experience to students in Computer Animation and Game Development or related majors. Students work as collaborators on large-scale, professional productions relevant to their field of study. Content of this course is subject to change each semester. 4 hours activity, 1 hour discussion.  (020563)
Grade Basis: Graded
Repeatability: You may take this course for a maximum of 12 units
Course Attributes: Upper Division

CAGD 498  Special Topics  1-3 Units
Typically Offered: Fall and spring
This course is for special topics offered for 1.0-3.0 units. Typically the topic is offered on a one-time-only basis and may vary from term to term and be different for different sections. See the Class Schedule for the specific topic being offered. 3 hours lecture.  (015891)
Grade Basis: Graded
Repeatability: You may take this course more than once
Course Attributes: Upper Division

CAGD 499  Special Problems  1-3 Units
Prerequisite: Faculty permission.
Typically Offered: Fall and spring
This course is an independent study offered for 1.0-3.0 units. You must register directly with a supervising faculty member. 0 hours supervision.  (020136)
Grade Basis: Credit/No Credit
Repeatability: You may take this course for a maximum of 6 units
Course Attributes: Upper Division

CAGD 499H  Honors Project  3 Units
Prerequisite: Junior standing, top 5% of major.
Typically Offered: Fall and spring
An enrolled student must be sponsored by a full-time faculty member in Computer Animation and Game Development. Independent study resulting in a piece of scholarly or creative work involving substantial research to be completed and publicly presented. Must receive a grade of B or higher. This course must be taken during two consecutive semesters in order to complete the 6-unit Honors project. This course is not available to graduate students. 9 hours supervision.  (020643)
Grade Basis: Graded
Repeatability: You may take this course for a maximum of 6 units
Course Attributes: Upper Division
CAGD 545  Advanced Animation Post-Production  3 Units  
Prerequisite: CAGD 330 or CAGD 340, CAGD 345W  
Typically Offered: Spring only  
This course focuses on the completion of animation projects in the post-production environment, including editing, music, sound effects, and other post-production elements to successfully complete professional-level short animations. Emphasis is on working as a member of a computer animation team, similar to a real-world production facility. 3 hours discussion. (020248)  
Grade Basis: Graded  
Repeatability: You may take this course for a maximum of 3 units  
Course Attributes: Upper Division  

CAGD 589  Industry Internship  1-3 Units  
Typically Offered: Fall and spring  
0 hours supervision. (020129)  
Grade Basis: Credit/No Credit  
Repeatability: You may take this course for a maximum of 15 units  
Course Attributes: Upper Division  

CAGD 598  Special Topics  1-3 Units  
Prerequisite: Department permission.  
Typically Offered: Fall and spring  
This course is for special topics offered for 1.0-3.0 units. Typically the topic is offered on a one-time-only basis and may vary from term to term and be different for different sections. See the Class Schedule for the specific topic being offered. 0 hours lecture. (020132)  
Grade Basis: Graded  
Repeatability: You may take this course more than once  
Course Attributes: Upper Division  

CAGD 599  Special Problems  1-3 Units  
Prerequisite: Faculty permission.  
Typically Offered: Fall and spring  
This course is an independent study of special problems offered for 1.0-3.0 units. You must register directly with a supervising faculty member. 0 hours supervision. (020137)  
Grade Basis: Credit/No Credit  
Repeatability: You may take this course for a maximum of 6 units  
Course Attributes: Upper Division  

CAGD 697  Independent Study  1-6 Units  
Typically Offered: Fall and spring  
0 hours supervision. (020138)  
Grade Basis: Credit/No Credit  
Repeatability: You may take this course for a maximum of 10 units  
Course Attributes: Graduate Division  

CAGD 698  Graduate Seminar in Computer Graphics  3 Units  
Typically Offered: Inquire at department  
3 hours seminar. (020402)  
Grade Basis: Graduate Graded  
Repeatability: You may take this course for a maximum of 3 units  
Course Attributes: Graduate Division