Texas A&M University
Departmental Request for a New Course
Undergraduate • Graduate • Professional
• Submit original form and attach a course syllabus.

1. This request is submitted by the Department of Visualization.

2. Course prefix, number and complete title of course: VIZA 626 - Generative Art and Design

3. Course description (not to exceed 50 words):
Theory and creative application of generative systems in studio art practice; chaos based systems include random numbers and noise; biologically inspired systems include genetic algorithms, L-systems, and artificial life; systems drawn from complexity theory include, cellular automata, fractals, finite state machines, catastrophe theory, reaction diffusion systems, and chaos.

4. Prerequisite(s): Graduate classification in Visualization or approval of instructor.

5. Is this a variable credit course? ☐ Yes ☑ No If yes, from _______ to _______

6. Is this a repeatable course? ☑ Yes ☐ No If yes, this course may be taken ______ times.
Will this course be repeated within the same semester? ☐ Yes ☑ No

7. Has this course been taught as a 489.689? ☐ Yes ☑ No If yes, how many times? ______
Indicate the number of students enrolled for each academic period it was taught.

8. This course will be:
a. required for students enrolled in the following degree program(s) (e.g., B.A. in history)

b. an elective for students enrolled in the following degree program(s) (e.g., M.S., Ph.D. in geography)

M.S. in Visualization Science

9. If other departments are teaching or are responsible for related subject matter, the course must be coordinated with these departments. Attach approval letters.

10. Prefix Course # Title (excluding punctuation)

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<th>VIZA</th>
<th>626</th>
<th>GENERATIVE ART &amp; DESIGN</th>
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Approval recommended by: 5/4/09

Head of Department Date

Chair, College Review Committee Date

Head of Department (if cross-listed course) Date

Dean of College Date

Submitted to Coordinating Board by: Date

Associate Director, Curricular Services Date

Effective Date

Questions regarding this form should be directed to Sandra Williams at 845.8201.
Curricular Services – 11/07

1 of 8 B10
VIZA 626 – Generative Art and Design
Fall 2009, MW 12:40 – 2:20, F 12:40 – 1:30 Langford C414

Instructor: Philip Galanter

ARCC 306, phone: 979-845-4710, email: galanter@viz.tamu.edu
Office hours: TBA

Graduate Assistant: TBA

Visualization Lab, ARCC 412, email: TBA
Office Hours: TBA

Course Description

Theory and creative application of generative systems in studio art practice; chance based systems include random numbers and noise; biologically inspired systems include genetic algorithms, L-systems, and artificial life; systems drawn from complexity theory include, cellular automata, fractals, finite state machines, catastrophe theory, reaction diffusion systems, and chaos.

Prerequisites:

Graduate classification in Visualization or approval of instructor.

About the Class

This course operates as an art and design studio class. Graded work is primarily student projects that use the lecture and reading content as a point of creative departure. Modest independent exploration of recent research in the field is also required.

Related technologies and art movements will be surveyed. These may include the Processing and NetLogo programming environments, math art, minimal and conceptual art, physical computing, robotic art, and generative music and sound art. Additionally, concepts from complexity theory will be introduced as a foundation and context for generative art and design.
Learning Outcomes and Course Objectives

Upon successful completion of this course students will be able to:

- Name, describe, and explain generative art techniques
- Include completed projects from the class in their portfolio
- Apply generative techniques in future class projects and beyond
- Describe relationships between the technology and their own work
- Combine generative methods in unique and expressive ways
- Cite artists and works that exploit generative systems
- Critique generative art in terms of both technology and aesthetics
- Contextualize their own generative work relative to other artists

Textbooks and Readings


Other papers, articles, web pages, and excerpts as assigned. An extensive bibliography is available here:

http://www.philipgalanter.com/generative_art/bibliography.html

Course Calendar

Weeks 1 – 2  Chance based systems - Short project #1

Mathematics of probability, physically based chance operations, combinatorials and Pascal's triangle, uniform and Gaussian distributions, variance and the law of large numbers, designing and generating discreet and continuous distributions, noise, Perlin noise, finite state machines and Markov processes, history and theory of use in art

Weeks 3 – 5  Biologically inspired systems - Short project #2

Biological genetics, genetic programming and evolutionary methods, adaptations for use in art, genotype design, phenotype mapping, Grey code, L-systems, artificial life, reaction diffusion systems, history
and theory of use in art

Weeks 6 - 8
Complexity derived systems – Short project #3
Systems integration – Short project #4

Hysteresis, catastrophe theory, fractals, cellular automata, chaos theory, complex physical systems, history and theory of use in art. Also combining multiple generative systems.

Weeks 9 - 14
Final Project

In-class brainstorming, debugging, and critique of original individual art and design projects

Also a research project and short presentation will be assigned.

Supplemental lectures on complexity and generative art theory, related art movements, simple generative systems based on symmetry and tiling, math art

For Repeat Students

Students taking the class a second time will participate in all classroom discussions and critiques, and will also execute a research project and short presentation. However, rather than participating in the four short projects repeat students will execute both an initial and a final project.

Grading Policies

Grades will be calculated using the following point-based system:

First time students

4 projects, 100 points each 400
1 final project during the second half of the semester 400
Classroom participation 100
Research project 100

TOTAL 1000
Repeat students

1 initial project to be completed before midterm  400
1 final project during the second half of the semester  400
Classroom participation  100
Research project  100

TOTAL  1000

In support of the above attendance and punctuality is essential. Only one unexcused absence will be allowed without penalty. Beginning with the second occurrence a 50 point deduction will be made for each unexcused absence.

In addition, late assignments without related excused absences will be reduced by 10 points, and an additional 10 points for each additional week late.

Grading Scale

A / 1000-900  B / 899-800  C / 799-700  D / 699-600  F / 599 and below

The instructor’s qualitative judgment of the student’s exercises, projects, and research will include such factors as preparation, presentation, conceptualization, technical application, documentation, and aesthetic effectiveness.

The instructor’s qualitative judgment of the student’s in-class participation will include such factors as attendance, preparation, engagement, professional demeanor, and informed contribution to discussions and critique sessions.

Assignment Grading Practice

As an aide to understanding the method by which your assignments are evaluated, read the following carefully. The actual grading criteria will be related to these categories but will be more specific to the given assignment. The scores noted below are relative to a 100 point assignment.

F: 60 and below: The student work is unresolved; the intentions are unclear and major criteria or goals lack resolution; Presentation is incomplete and/or of poor quality; There is a complete lack of problem
solving intent, artistic content and/or visual merit.

D: 60 - 70: The work has problems in two or more major areas; Skill and problem development is marginal or incomplete; The project lacks imagination and/or design/artistic potential.

C: 70 – 80: The student has completed the basic assignment, but the work lacks depth of understanding; Some aspects are not completely satisfied and the work contains little promise even though most issues have been addressed.

B: 80 – 90: The student work shows imagination and potential; Presentation and visual content is good; The assignment requirements are fulfilled but in need of more refinement or development; There are no major issues that would require a total redesign of the project.

A: 90 – 100: The student work has imagination and the response to the assignment show understanding and thought; The work is highly developed and well presented; The entire project shows depth and breath and is well coordinated; The project potential has been achieved.

**Class Participation Grading Practice**

As an aide to understanding the method by which your class participation is evaluated, read the following carefully. The actual grading criteria will be related to these categories but will be more specific to the given topic. The scores noted below are relative to a 100 point total.

F: 60 and below: The student is consistently absent or significantly late to class; is rarely prepared for class; is rarely a willing participant or responsive to questions; consistently exhibits unprofessional and/or disruptive behavior; offers virtually no considered opinions, researched information, or constructive criticism.

D: 60 - 70: The student is frequently absent or significantly late to class; is only occasionally prepared for class; is only occasionally a willing participant or responsive to questions; frequently exhibits unprofessional and/or disruptive behavior; only infrequently offers considered opinions, researched information, and constructive criticism.

C: 70 – 80: The student is occasionally absent or significantly late to class; is inconsistently prepared for class; is sometimes a willing participant and responsive to questions; infrequently exhibits unprofessional and/or
disruptive behavior; inconsistently offers considered opinions, researched information, and constructive criticism.

B: 80 – 90: The student is rarely absent or significantly late to class; is consistently prepared for class; is frequently a willing participant and responsive to questions; almost never exhibits unprofessional and/or disruptive behavior; usually offers considered opinions, researched information, and constructive criticism.

A: 90 – 100: The student is never absent without excuse or significantly late to class; is always very well prepared for class; is always a willing participant and responsive to questions; never exhibits unprofessional and/or disruptive behavior; always offers considered opinions, researched information, and constructive criticism.

Attendance

The University views class attendance as the responsibility of an individual student. Attendance is essential to complete the course successfully. University rules related to excused and unexcused absences are located on-line at http://student-rules.tamu.edu/.

Copyright

The handouts used in this course are copyrighted. "Handouts" include all materials generated for this class, which include but are not limited to the on-line course notes, syllabi, exams, quizzes, problems, in-class materials, review sheets, additional problem sets, and the contents of the class Web site. Because these materials are copyrighted, you do not have the right to copy them, unless you are expressly granted permission. You have permission to make printouts of the on-line class notes and the class web site strictly for your use in this class.

Plagiarism

In this course, we want to encourage collaboration and the free interchange of ideas among students and in particular the discussion of reading and writing assignments and review questions, approaches to solving them, etc. However, we do not allow plagiarism, which, as commonly defined, consists of passing off as one's own the ideas, words, writings, etc. which belong to another. In accordance with this definition, you are committing plagiarism if you copy the work of another person and
turn it in as your own, even if you have the permission of that person. Plagiarism is one form of scholastic dishonesty. If you have questions regarding plagiarism, please consult the latest issue of the Texas A&M University Student Rules, under the section on Scholastic Dishonesty.

Please note the use of source code, software libraries, images and sound, and other materials from outside sources is only allowed when it is clearly declared at the time the assignment is turned in, and when doing so does not violate copyright or other limitations stipulated by the original creator.

**Aggie Honor Code**

"An Aggie does not lie, cheat or steal, or tolerate those who do"

Upon accepting admission to Texas A&M University, a student immediately assumes a commitment to uphold the Honor Code, to accept responsibility for learning, and to follow the philosophy and rules of the Honor System. Students will be required to state their commitment on examinations, research papers, and other academic work. Ignorance of the rules does not exclude any member of the TAMU community from the requirements or the processes of the Honor System.

For additional information please visit: [http://www.tamu.edu/aggiehonor/](http://www.tamu.edu/aggiehonor/)

**Americans with Disabilities Act**

The Americans with Disabilities Act (ADA) is a federal anti-discrimination statute that provides comprehensive civil rights protection for persons with disabilities. Among other things, this legislation requires that all students with disabilities be guaranteed a learning environment that provides for reasonable accommodation of their disabilities. If you believe you have a disability requiring an accommodation, please contact Disability Services, in Cain Hall, Room B118, or call 845-1637. For additional information visit [http://disability.tamu.edu](http://disability.tamu.edu).