

GE COURSE EXPANDED COURSE OUTLINE

I. Catalogue Description

ARC 111. An Introduction to the Theory and Practice of Description Geometry (4 units)
C2 (graded)

Introduction to major conventions of graphic representation. The principles of constructing orthographic, axonometric and perspectival projections. Introduction to the history of graphic representation in the Western European and non-Western-European traditions. Introduction to contemporary philosophical schools critical of Western European Vision centric cultures.

II. Required Background or Experience

Open to students from all departments. No prerequisite required. It is expected that the course will attract an especially large number of students from the College of Environmental Design, from the College of Engineering, as well as from a number of departments within the College of Science and the College of Letters, Arts and Social Sciences (especially the Departments of Communication, Geography and Anthropology, and Theatre and New Dance). However, the course will certainly attract and benefit students from all the other colleges and departments within the University.

The class will offer one or two Honors sections that will include more rigorous exercises and advanced readings

III. Expected Outcomes

Outcomes A (skills and abilities)

1. Understanding the concepts of the parallel projection (orthographic and axonometric representation) and of the "cone of vision" (perspective).
2. Development of basic skills in analogue and digital technical drawing, diagramming, and in free-hand sketching for non-art, non-architecture majors

Outcomes B

- 1b. (evaluate data employing information and communication technology)
 - Developing an ability to read technical drawings and understand visual data communication
- 2b. (analyze major literary, philosophical, historical, or artistic works and describe their aesthetic, historical, and cultural significance in society)
 - Development of basic understanding of the history of representation (proto-orthographic representation in Ancient Egypt, examples of early map-making around the world, the late-medieval architectural drawings, the Renaissance

- “invention” of perspective and orthographic representation, the evolution of representation in the early Modern and Modern world)
- Understanding of the impact of the described above methods on post-Renaissance cultures.
- 3b (Apply principles, methods, value systems, and ethics to social issues confronting local and global communities)
- Introduction to philosophical thought critical of Western European ocular-centric culture

IV. Texts and Readings

Frank Ching, *Drawing: A Creative Process*, New York: Van Nostrand Reinhold, 1990

Samuel Y. Edgerton, *The Heritage of Giotto's Geometry: Art and Science on the Eve of the Scientific Revolution*, Cheshire, Connecticut: Graphic Press, 1997

Robin Evans, *Translations from Drawings to Buildings*, Cambridge, Massachusetts: The MIT Press, 1997

Alberto Pérez-Gómez and Louise Pelletier, *Architectural Representation and Perspective Hinge*, Cambridge, Massachusetts: 1997

Edward Tufte, *Visual Explanations: Images and Quantities, Evidence and Narrative*, Cheshire, Connecticut: Graphics Press, 1997

V. Additional Instructional Materials

Additional instructional materials (tutorials and illustrations) will consist of the lecture slides and notes, tutorials, and additional readings. They will be developed for each lecture and a number of laboratory sessions and placed on the Blackboard

VI. Minimum Student Material

In order to complete the course-work students will be required to purchase drafting and drawing equipment and soft-ware not to exceed \$250.00

VII. Minimum College Facilities

Large lecture hall with blackboard / whiteboard, overhead projector, video / audio equipment and Internet connection. Regular classroom (labs) with blackboard / whiteboard, overhead projector, video / audio equipment and Internet connection

VIII. Instructional Methods

Face to face. 3 hours lecture (3 units) and 3 hours laboratory per week (1 units). Lectures will consist of tutorials in descriptive geometry methods and will cover major steps in the evolution of the discipline from the 15th century (the Renaissance “reinvention” of perspective) to Gaspar Monge’s formulation of the major rules of projective drawing (end of the 18th century) to the critique of perspectival vision by the architectural and artistic avant-garde in the course of the 20th century. Laboratories will cover in-class exercises exploring different techniques of visual representation and discussions of historic and cultural material covered in lectures (and, in honor section, of additional essays assigned specifically in these sections)

IX. Tentative Course Plan

Segment 1 (weeks 1-2): Understanding the essence of planar geometric projection.

Tutorials and Exercises:

- a. Constructing the third view of an object
- b. Understanding the oblique projection
- c. Determining the “true” length of a line, the “true” size of an object
- d. Sections of the solids (sphere, cylinder, cone)

Lectures and Discussion: Renaissance and the discovery of the concept of representation of depth in a 2-dimensional media

Reading: Excerpts from Robin Evans, *Translations from Drawings*

Segment 2 (weeks 3-4): Understanding Axonometric representation (Isometric, Dimetric, Trimetric projections, and Oblique elevation)

Tutorial and Exercises: Construct Isometric, Dimetric, Trimetric views of an object

Lectures and Discussion: Graphic representation in the 16th and the 17th centuries and the beginning of the Scientific and the Industrial Revolution

Reading: Excerpts from Samuel Edgerton, *The Heritage of Giotto’s Geometry* ...

Segment 3 (weeks 5-6): Understanding shades and shadows from the Sun and from artificial sources of light

Tutorials and Exercises: Construct shades cast by and on a complex object in a orthographic and an axonometric view of an object

Lectures and discussion: The Baroque and the Oblique

Reading: Excerpts from Alberto Perez-Gomez and Louise Pelletier, *Architectural Representation*

Segment 4 (weeks 7-8): Understanding linear perspective

Tutorials and Exercises: Understanding the notion of the “cone of vision” and of the “picture plane” and using them in constructing perspective views of simple objects

Lecture and discussion: The poetics of perspective

Reading: TBA

Segment 5 (weeks 9-10): Hand-Drawing vs. the Computer

Tutorials and Exercises: Understanding how hand-drawing skills can enhance the use of the digital tools—and vice-versa.

Lectures and discussion: Constructing the visual regime of Modernity. Conclusion

X. Evaluation of the Outcomes and Assessment

A. Students' learning outcomes will be evaluated based on both observable and measurable methods, which include:

1. Class attendance and participation in the discussions
2. The assignments (consisting of simple analogue and digital visual constructions) will be issued in the beginning and collected in the end of each of the 4 first segments (Outcomes A1)
3. Final drawing exercise (Outcomes A2 and B1b)
4. Term paper (5-6 pages) (Outcomes B2b and B3b)

B. General Education Outcome Assessment

The course will be evaluated in an ongoing manner. Students will be requested to provide feedback several times per term to determine the appropriateness of the pace, the adequacy of tasks, efficiency of the instructional materials and media. There will also be a survey of students evaluations of the course two and three years past its completion in order to determine the usefulness of the course for