California University of Pennsylvania
Guidelines for New Course Proposals
University Course Syllabus
Department of Art and Languages
UCC Approval date: 12/5/2016

A. Protocol

Course Name: Natural Science Drawing
Course Number: ART233
Credits: 3
Prerequisites: None
Maximum Class Size (face-to-face): 35
Maximum Class Size (online): N/A

B. Objectives of the Course:

Upon completion of the course, students should be able to:

1. Develop skill and discipline in visual acuity through the careful observation and rendering of details.

2. Investigate the structural forms of organisms using drawing styles and compositional strategies practiced in scientific illustration.

3. Develop technical skills in the manipulation of drawing media: pencil, pen and ink, watercolor or oil.

4. Organize the elements of a composition according to design principles.

5. Acquire a vocabulary of art and design terms and concepts that will allow students to discuss and evaluate artworks as well as the biological structures of plants and animals.

6. Critique the work of classmates and apply recommendations to the drawing process.

7. Research and identify specimens using museum and library resources and investigate the multiple approaches of other artists who have illustrated these species.

8. Conduct visual research using cameras, scanners, and online image databases to portray organisms in various aspects and at various stages of development.

9. Explore visual parallels in art and science, and be exposed to masterworks of natural science illustration, landscape painting, and nature painting.

10. Research and deliver an oral presentation on a natural science illustrator or landscape/animal painter.

11. Research the form, function, and structural design of an organism to be used as a prototype product design in a final project on applied biological design.

12. Demonstrate the proper handling of biological specimens and conduct safe, clean, and professional studio practices in each class meeting.

13. Organize an exhibition of student artworks at the end of the course.

1)

C. Catalog Description:

An introductory course in observational drawing from biological specimens and outdoor field studies. Working with plant, animal, and landscape subjects, students will focus on the careful observation of natural forms and phenomena. Students will practice methods of scientific illustration through detailed renderings of organisms from direct observation supplemented by visual research. Through slide lectures, students will be introduced to masterworks of natural science drawing, as well as the work of great landscape painters and animal artists. Outdoor field trips will include specimen-gathering and the sketching of landscapes with clouds, water, waves, and land forms. Advanced art students will have the option of working in color with oils or watercolor. Upper level science students may concentrate on drawing subjects that relate to their particular areas of interest. The course is repeatable.

Click here to enter text.

D. Teaching Methodology:

1) Traditional Classroom Methodology

In addition to studio/lab drawing and outdoor field studies, course material will be presented through research assignments, slide lectures, videos, reading assignments, class discussions, oral presentations, and critiques. Students will also conduct research with cameras, scanners, microscopes, and online visual resources.

2) Online Methodology
N/A

E. Suggested Texts

Curtis, Brian. *Drawing from Observation: an Introduction to Perceptual Drawing.* New York: McGraw-Hill, 2009

Baumeister, Dayna. *Biomimicry Resource Handout: A Seed Bank of Best Practices.* Missoula, MT, Biomimicry 3.8, 2014

F. Traditional Classroom Assessment

Student work is assessed through the grade point average of class drawings, research, quizzes, oral presentations, participation in class critique, final project and end-of-semester exhibition.

Online Assessment
N/ A

G. Accommodations for Students with Disabilities:

OSD
Revised June 2015

STUDENTS WITH DISABILITIES

Students reserve the right to decide when to self-identify and when to request accommodations. Students requesting approval for reasonable accommodations should contact the Office for Students with Disabilities (OSD). Students are expected to adhere to OSD procedures for self-identifying, providing documentation and requesting accommodations in a timely manner.

Students will present the OSD Accommodation Approval Notice to faculty when requesting accommodations that involve the faculty.

Contact Information:

Location: Carter Hall - G-35
Phone: (724) 938-5781
Fax:(724) 938-4599
Email: osdmail@calu.edu
Web Site: http://www.calu.edu/osd

H. Title IX Syllabus Addendum

California University of Pennsylvania
Reporting Obligations of Faculty Members under Title IX
of the Education Amendments of 1972, 20 U.S.C. §1681, *et seq.*

California University of Pennsylvania and its faculty are committed to assuring a safe and productive educational environment for all students. In order to meet this commitment and to comply with the Title IX of the Education Amendments of 1972 and guidance from the Office of Civil Rights, the University requires faculty members to report incidents of sexual violence shared by students to the University's Title IX Coordinator, Dr. John A. Burnett, Special Assistant to the President for EEEO, Office of Social Equity, South Hall 112, Burnett@calu.edu, 724-938-4014. The only exceptions to the faculty member's reporting obligation are when incidents of sexual violence are communicated by a student during a classroom discussion, in a writing assignment for a class, or as part of a University-approved research project. Faculty members are obligated to report sexual violence or any other abuse of a student who was, or is, a child (person under 18 years of age) when the abuse allegedly occurred to the person designated in the University protection of minors policy.

The University's information regarding the reporting of sexual violence and the resources that are available to victims of sexual violence is set forth at:

- **Office of Social Equity**, South Hall 112, 724-938-4014
  - Social Equity Home Page www.calu.edu/SocialEquity
  - Social Equity Policies www.calu.edu/SEpolicies
  - Social Equity Complaint Form www.calu.edu/SEcomplaint
- **Counseling Center**, Carter Hall G53, 724-938-4056
- **End Violence Center**, Carter Hall G94, 724-938-5707
- **Student Affairs**, Natali Student Center 311, 724-938-4439
- **Wellness Center**, Carter Hall G53, 724-938-4232
- **Women's Center**, Natali Student Center 117, 724-938-5857
- **Threat Response Assessment and Intervention Team** (T.R.A.I.T.) & **Dept. of Public Safety & University Police**, Pollock Maintenance Building, 724-938-4299
  - **EMERGENCY:** From any on-campus phone & Dial **H-E-L-P** or go to any public pay phone & **Dial *1**. (*Identify the situation as an emergency and an officer will be dispatched immediately.)

I. Supportive Instructional Materials, e.g. library materials, web sites, etc.

Online visual reference resources for this course are available through the Manderino Library.

1. Go to Artstor : Public Folders: Natural Science Images

2. Library Homepage: Quick Links: Find Resources by Subject: Class Guides: Art and Design: Biological Illustration.

Supporting Literature and suggestions for visual research. Many of the slides used in this course are taken from the following books.

Armstrong, Carol and De Zegher, Catherine. *Ocean Flowers: Impressions from Nature.* Princeton and Oxford: Princeton University Press, 2004

Ball, Philip. Shapes: a tapestry in Three Parts, New York: Oxford University Press, 2009

Bager, Bertal. *Nature as Designer: A Botanical Art Study*. New York: Reinhold, 1977

Baker, Steve. *The Postmodern Animal*, London: Reaktion Books, 2000

Baumeister, Dayna. Biomimicry Resource Handout: A Seed Bank of Best Practices. Missoula, MT, Biomimicry 3.8, 2014

Blossfeldt, Karl. *Art Forms in the Plant World.* New York: Dover Publications, 1985.

Benyus, Janine. Biomimicry: Innovation inspired by Nature NewYork: Harper Perennial, 1997

Blunt, Wilfred and Stearn, William. *The Art of Botanical Illustration.* Woodbridge, Suffolk: 1994.

Clark, Kenneth. *Animals and Men.* New York: Wm. Morrow and Co., 1977.

Colquhoun and Ewald, *New Eyes for Plants: Workbook for observing and drawing plants.* Stroud:1996

Cook, Theodore. *The Curves of Life: Being an Account of Spiral Formations and their Application to Growth in Nature, Science , and Art.* New York: Dover, 1979

Croney, John. *Drawing by Sea and River.* Cincinnati: North Light, 1985

Dance, S. Peter. *The Art of Natural History.* New York, Arch Cape Press, 1990

Da Vinci, Leonardo. *The Notebooks.* New York: Oxford University Press, 2008

Donald, Diana and Jane Munro. *Endless Forms: Charles Darwin and the Visual Arts.* New Haven: Yale University Press, 2009

Dowden, A.O. *From Flower to Fruit.* New York: Houghton Mifflin, 1994.

_____. *The Clover and the Bee.* Pittsburgh: Harper Collins, 1990.

Doczi, Gyorgy. *The Power of Limits: Proportional Harmonies in Nature, Art, and Architecture.* Boston and London: Shambhala, 1994

Guild of Natural Science Illustrators. *Careers in Scientific Illustration,* Washington, DC, 2010

Haeckel, Ernst. *Art Forms from the Ocean.* New York: Prestel Verlag, 2005.

_____. *Art Forms in Nature.* New York: Prestel Verlag, 1998.

_____. *Art Forms from the Abyss:* Ernst Haeckel's Images from the Challenger Exhibition. New York, Prestel, 2015

Hale, Nathan Cabot. *Abstraction in Art and Nature.* New York: Dover, 1993

Hildebrant and Tromba. *Mathematics and Optimal Form.* NY: Scientific American Books, 1986

Jacobs, Michael. *The Painted Voyage: Art Travel and Exploration 1564-1875.* London: British Museum Press, 1995

Kemp, Martin and Wallace Marina, *Spectacular Bodies: The Art and Science of the Human Body*

from Leonardo to Now. Berkeley: U. of Cal. Press, 2000

Knight, David M. *Natural Science Books in English, 1600-1900.* London: Portman Books, 1989

Lack, H. Walter. *Masterpieces of Botanical Illustration:* Garden of Eden. New York: Taschen, 2001.

Lippincott, Louise and Andreas Bluhm. *Fierce Friends: Artists and Animals, 1750-1900.* Pittsburgh: Carnegie Museum, 2006.

Mabey, Richard. *The Flowers of Kew.* New York: Atheneum, 1989..

Murdoch, John E. *Album of Science: Antiquity and the Middle Ages.* N.Y. Scribner's Sons, 1984

Ormond, Richard. *Sir Edwin Landseer*. London: The Tate Gallery, 1981

O'Malley and Saunders. *Leonardo Da Vinci on the Human Body: The Anatomical, Physiological and Embryological Drawings.* New York: Wings Books, 1982

Pinault, Madeleine. *The Painter as Naturalist: From Durer to Redoute.* Paris: Flammarion, 1991

Rappaport/Stayton. *Vital Forms: American Art and Design in the Atomic Age*, NY:Abrams, 2001

Rifkin and Ackerman. *Human Anatomy (from the Renaissance to the Digital Age).* New York: Abrams, 2006

Robin, Harry. *The Scientific Image: from Cave to Computer.* New York: Abrams, 1992

Schwenk, Theodor. *Sensitive Chaos: the Creation of Flowing Forms in Water and Air.* London: Rudolf Steiner Press, 2004

Strauss, Walter. *The Complete Drawings of Albrecht Durer.* (6 Vols)New York: Abaris Books, 1974

Thompson, D'Arcy. *On Growth and Form.* New York: Dover, 1992

West, Keith. *How to Draw Plants: The Techniques of Botanical Illustration.* Portland:Timber Press 2005.

_____*Painting Plant Portraits: A Step-by-Step Guide.* Timber Press. Portland. 1991

Wood, Phyllis. *Scientific Illustration: A guide to biological, zoological, and medical rendering techniques, design, printing, and display;* New York: Van Nostrand Reinhold, 1994.

Zweifel, Frances W. *A Handbook of Biological Illustration.* Chicago, U. of Chicago Press, 1997

Additional Information for Course Proposals

J. Proposed Instructors:

Any qualified art studio faculty from the Department of Art and Languages.

K. Rationale for the Course:

Click here to enter rationale for the course. Explain how the course fits into existing offerings within the program and the discipline in general, and why it is necessary, or desired as an addition or change to the current curriculum.

K. This course is intended as a Fine Arts and Lab course elective for the general education menu, offering students a liberal arts alternative to the traditional science Lab. The course content and observational skills developed will be useful to both art and science students, as well as to nursing, forensics, sports medicine, anthropology, or any other majors that require discipline and skill in careful visual observation. Art students accustomed to working in studios from photographs or imagination will have the experience of working outdoors and from the live animals and preserved specimens in the Frich Biology collection. Art and science students will benefit from the mutual exchange of skills and interests. Students interested in design will discover new developments in the field of bio-mimicry: artists and scientists using nature's designs to solve man's problems. Science majors needing to fulfill fine arts requirements may find this cross-disciplinary course more interesting, and with more practical applications, than a traditional fine arts lecture course, because they will learn how to sketch and design. Slide lectures will expose students to visual parallels in art and science, as well as various methods of scientific illustration. This initial experience may cause students to seek further connections between the disciplines, or possibly pursue the field of scientific, medical, biological illustration, or bio-design, as a career path. Currently, there are very few institutions nationally that offer this type of cross-disciplinary study.

Additional rationale for the course is that it reduces competition and course conflicts with other ART studios since it should appeal to students other than Art majors. Hopefully this will attract non-art students to the department to increase enrollment.

L. Specialized Equipment or Supplies Needed:

All specialized equipment is available through the Cal U Department of Art and Languages and will be provided.

M. Answer the following questions using complete sentences:

a. Does the course require additional human resources? (Please explain)

No, it does not require additional human resources..

b. Does the course require additional physical resources? (Please explain)

No, just the classroom in 211 Old Main and use of the Biology collections in Frich.

If Yes, click here to answer Question N2, above.

c. Does the course change the requirements in any particular major? (Please explain)

No, it does not. Art majors may repeat the course for art studio electives.

d. Does the course replace an existing course in your program? (If so, list the course)

No, it does not.

d. How often will the course be taught? The course will be offered once a year or every 3 semesters as needed.

Select the intended timing of the course.

e. The course will be offered once a year beginning Fall 2017.

f. Does the course duplicate an existing course in another Department or College? (If the possibility exists, indicate course discipline, number, and name)

No, it does not. Click here if the answer to Question N6, above is YES. Indicate the other discipline/department and the other course number and name.

g. If the proposed course includes substantial material that is traditionally taught in another discipline, you must request a statement of support from the department chair that houses that discipline.

N/A

N. Please identify if you are proposing to have this course considered as a menu course for General Education. The General Education Committee must consider and approve the course proposal before consideration by the UCC.

Yes, it should be considered for the General Education Menu as a Fine Arts selection and also as a Lab.

The course was written specifically with the intention of offering it on the General Education Menu because observational skills are applicable to a variety of disciplines. Through practice in observational drawing, students will develop the visual acuity and discipline necessary to make careful and accurate observations.

Learning to sketch, as well as render in careful detail, may also be of practical value to science, anthropology, nursing, or forensics students who may require drawing skills for research and fieldwork when photographs are unsuitable for recording complex observations. Science majors needing to fulfill fine arts requirements may find this cross-disciplinary course more interesting, and with more practical applications, than a traditional fine arts lecture course, because they will learn how to sketch, compose, and design.

The course should be considered for the Lab menu because drawings and sketches, and design projects created in the 3-hour bi-weekly studio/labs will account for 90% of the grade.

Slide lectures will expose students to visual parallels in art and science, as well as various methods of scientific illustration. Art and science students will benefit from the mutual exchange of skills and interests. This initial experience may cause students to seek out further connections between the disciplines, or possibly pursue the field of scientific, medical, or biological illustration, or bio-design, as a career path.

Yes or No?

O. Approval Form

Provide the Approval Form (Signature Page) with the signatures of your department Chair AND college Dean (electronically).

FULL REVIEW MENU COURSE APPLICATION FORM
FINE ARTS MENU
General Education Committee

COURSE PREFIX ART COURSE NUMBER 233

COURSE TITLE (as it appears in the University Catalog):

Natural Science Drawing

X New Course Proposal

Existing Course

Date of UCC approval:

_____

CONTACT PERSON Maggy Aston

Telephone 724-938-4563 Email Aston@calu.edu

DEPARTMENT CHAIR Arcides Gonzales

Telephone 724-938-4182 Email Gonzales@calu.edu

DATE OF DEPARTMENTAL APPROVAL:* 9/22/16

DATE OF COLLEGE COUNCIL APPROVAL:* 10/ 18/16

To your knowledge, will this course listed as a 'directed general education' course on any program advisement sheet? (If yes, please indicate which program(s)):

BFA Bachelor of Fine Arts

BA Bachelor of Arts

(Existing Courses Only) Has the UCC approved syllabus been changed in any way in order to complete this General Education application? (If yes, this course syllabus will be forwarded to UCC as part of this application process)

Listed below are the objectives of the Fine Arts menu along with justification for the inclusion of this course on the menu.

Goal–1.

To present, critique or analyze human values, beliefs, and emotions as they are conceptualized, formulated, and expressed through verbal, aural, and physical action and artifacts and perceived through the senses.

Drawing Objective 5. *Acquire a vocabulary of art and design terms and concepts that will allow students to discuss and evaluate artworks as well as the biological structures of plants and animals.*

Drawing Objective 6. *Critique the work of classmates and apply recommendations to the drawing process.*

Students sketch outdoors and in the studio. They create 4 scientific illustrations and a final design project during the course. Each stage of the illustration / design process is discussed in weekly critiques. The final critique includes an oral presentation and written artist's statement describing the relation between the form and function of a product design based upon a natural form.

Goal–2.
To attend and react to a performance or exhibit related to the discipline studied.

Drawing Objective 13. *Organize an exhibition of student artworks at the end of the course.*

The show is open to the public. Student responses to the show are voiced in a final critique at the display site in Frich Lobby and are evaluated as part of the final exam grade.

Goal–3c.*
To recognize how critical analysis and reasoning are used to address problems in the fine arts.

Drawing Objective 7. *Research and identify specimens using museum and library resources and investigate the multiple approaches of other artists who have illustrated these species.*

Students research the work of other biological illustrators to become familiar with compositional strategies for representing observations and conveying information about the natural world. Through this investigation students may be exposed to multiple interpretations of the same species filtered through the eyes of various artists.

FULL REVIEW MENU COURSE APPLICATION FORM
LABORATORY COURSE MENU
General Education Committee

COURSE PREFIX: ART

COURSE NUMBER: 233

COURSE TITLE (as it appears in the University Catalog):

Natural Science Drawing

[X] New Course Proposal

[ ] Existing Course

Date of UCC approval: _____

Maggy Aston

CONTACT PERSON

Telephone	724- 938-4563	Aston@calu.edu	
DEPARTMENT CHAIR	Arcides Gonzales		
Telephone	724-943-4182	Email	Gonzales@cal.edu

DATE OF DEPARTMENTAL APPROVAL:* 9/ 22 /16

DATE OF COLLEGE COUNCIL APPROVAL:*

10/ 18 /16

(Existing Courses Only) Has the UCC-approved syllabus been changed in any way in order to complete this General Education application? (If yes, this course syllabus will be forwarded to UCC as part of this application process)

Goal: 1: Use discipline specific methodologies and practices to systematically investigate the world.

Listed below are the objectives of the Lab menu along with justification for the inclusion of this course on the menu.

Drawing Objective #1 *Develop skill and discipline in visual acuity through the careful observation and rendering of specimens with patience and accuracy.*

Students create drawings from observation of live animals and plants and also view specimens through microscopes, scanners, and cameras. Students conduct further research on individual species through library and internet research on art and science websites.

Drawing Objective #2. *Students will investigate the structural forms of organisms using drawing styles and compositional strategies practiced in scientific illustration.*

Styles and methods include gesture sketch, field studies, line and value studies, schematic diagram, parts analysis, cross section, etc.

Drawing Objective #7. *Research and identify specimens using museum and library resources and investigate the multiple approaches of other artists who have illustrated these species.*

Drawing Course Objective #10 *Research and deliver an oral presentation on a natural science illustrator or landscape/animal painter*

Students research the work of other biological illustrators to become familiar with various drawing styles and compositional strategies employed in scientific illustration. Through this research they are exposed to multiple interpretations and representations of the particular species (or land forms / water forms) they are investigating. For example, students examine how Durer renders fur and feathers with watercolor, or how Leonardo illustrates flowing water and wave forms in pen and ink.

Students are given a list of art and design terms, are tested on vocabulary, and expected to use discipline-specific terms in an oral presentation on a scientific illustrator or natural science draftsman. Students are also taught how to identify and label species with the binomial classification system.

Goal: 2: Organize data into trends and patterns using quantitative and/or qualitative methods (spatial, graphical, symbolic, etc.) to sort, analyze, and interpret natural phenomena.

Drawing Objective #8 *Conduct visual research using cameras, scanners, and online image databases to portray organisms in various aspects and at various stages of development.*

By patiently observing and rendering the minute details of organisms, students acquire skills in visual observation and digital documentation that allow them to notice subtle differences between subspecies or changes in organisms over a period of time.

Drawing Objective # 4. *Organize the elements of a composition according to design principles.*

Students combine detailed enlargements, cross sections, schematic diagrams, etc. on the page with line drawings and full chiaroscuro renderings of the specimen subject. Parts are labeled, and subspecies are identified with the correct scientific names through visual online research.

Goal 3: Effectively communicate results of a set of applied experiments or observations.

Drawing Objective #1 *Develop skill and discipline in visual acuity through the careful observation and rendering of specimens with patience and accuracy.*

Drawing Course Objective #13. *Organize and attend an end-of-semester exhibition and sale of student artworks.*

Students draw live specimens from observation over the course of three weeks per specimen. In addition to outdoor landscape studies, they observe a total of 5 different plants or animals (or water and landforms), some of them in different stages of development, such as mature frogs and tadpoles, caterpillars and butterflies, etc. They also dissect and cross-section plants or insects and investigate the parts greatly magnified through high resolution scans. This type of observational research is presented within a single drawing that might show several aspects of the specimen in various growth stages or with diagrams of parts analysis. Though students may supplement their drawings with online research, they are required to create their drawings from observation of the live specimens

right in front them. Students discuss their subjects during weekly class critiques, and eventually present their drawings in a public exhibition.

***Drawing Objective #* 11.** *Express in both visual and written/oral format the relationship between biological form and function.*

For example, a student might draw a diagram of a cross-section of a flower to show how the reproductive parts are designed to facilitate pollination by particular insects. They would research, identify, and label the structural parts on the illustration and also explain to the class during oral critiques how the structural design facilitates pollination.

Research on the functional and structural design of a particular organism is used to create a prototype product design in a final project on biomimicry and applied biological design, such as maple seeds and fan blades or bat wings and hang gliders. This project includes observational sketches, original photographs or scans, visual research from online databases, concept drawings, a written artists statement, and a three-dimensional model.

Goal 4: Assess differences between theory and experimental results during evaluation of experimental design.

Drawing Objective #6 *Give and receive criticisms to and from peers and apply these criticisms to the illustration of natural science.*

Students create sketches outdoors and in the studio and animal rooms, plus 4 scientific illustrations and a final design project during the course. Each stage of the illustration process is discussed in weekly critiques. This includes proper identification of species; visual research and photo-documentation of the various stages of the life-cycle of the organism; rendering techniques and schematic diagrams; compositional strategies for effective visual documentation of biological organisms; and a functional product model based on a biological design. Illustrations and 3-D models are labeled, matted, framed, photographed and critiqued as part of an end-of-semester exhibition in the lobby of Frich Hall.

90% of the course grade is based on field sketches and lab sketches and 5 illustration/ design projects drawn from observation in the studio/lab, supplemented with photographs and online visual research.