

California University of Pennsylvania
Guidelines for New Course Proposals
University Course Syllabus
Department of Art and Design
UCC Approval date: 11/7/2016

A. Protocol

Course Name: Biological Illustration: Form and Function
Course Number: ART/BIO 130
Credits: 3
Prerequisites: none
Maximum Class Size (face-to-face): 18
Maximum Class Size (online): N/A

B. Objectives of the Course:

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

Biology Objectives

Students will:

1. Identify the characteristics of good quality science, and practice the basic methodology by which biological science is conducted.
2. Distinguish the major groups of living organisms.
3. Explain the modern system of biological classification and the basic rationale for this system.
4. Summarize and contrast the basic modes of nutrition, patterns of reproduction, life cycles, ecology, morphology, anatomy, growth, and economic importance of a diverse range of living organisms.
5. Research and produce a written summary of their observations of a particular organism that was studied over an extended period.
6. Research and deliver an oral presentation summarizing their basic observations on a particular organism that was studied over an extended period.

Drawing Objectives

Students will:

1. Develop technical skills in the manipulation of drawing media.
2. Organize the elements of a composition according to design principles.
3. Create the illusion of 3-dimensional form through the use of chiaroscuro and markmaking.
4. Experiment with different approaches to illustration through a variety of rendering styles (gesture sketch, line and value studies, schematic diagram, parts analysis, cross section, etc.)
5. Become familiar with well-known works of natural history illustration and nature painting.
6. Give and receive criticisms to and from peers and apply these criticisms to the drawing process.

7. Organize an end of semester exhibition of student artworks.

Shared Biology / Drawing Objectives

Students will:

1. Acquire the visual skills and discipline necessary to describe biological specimens patiently and accurately.
2. Develop skills in visual acuity through the careful observation and rendering of details.
3. Express in both visual and written format the relationship between biological form and function.
4. Explore visual parallels in art and science.
5. Acquire a vocabulary of art and science related terms and concepts that will allow students to discuss and interpret both art and biology.
6. Develop and practice skills in oral presentation of student research.
7. Demonstrate the proper handling of biological specimens, and conduct safe, clean, and professional studio practices in each class meeting.

C. Catalog Description: An introductory course in Biology and Drawing with an emphasis on the relation between form and function. Working with plants and animals, and using a combination of macroscopic and microscopic specimens, students will focus on the careful observation and interpretation of biological forms. Drawing instruction will focus on a variety of techniques commonly used in the biological sciences. Biology instruction will introduce students to basic scientific methodology, the diversity of living forms, the variety of ecological strategies related to those forms, and their scientific classification.

D.

Outline of the Course

Week 1

Biology: Introduction and examples of how, along with an explanation of why, biological illustration is used in the biological sciences.

Drawing: Introduction and materials discussion. Picture Plane. Methods of Sighting and Measuring. **Drawing**

Slide Lecture: *Composing the page: The Notebooks of Leonardo DaVinci.*

Week 2

Biology: An explanation of what science is; what features characterize good quality science, and how biologists define living organisms.

Drawing: Use of viewfinder. Beginning to sketch with line: methods of sighting and measuring. Studies in symmetry with positive and negative space. Visual comparisons of cow and with dinosaur bones. **Slide**

Drawing Lecture: *How drawings begin and how they evolve*

Week 3

Biology: How we organize Information about biological diversity: Taxonomy, Evolution, and the Three

Domains.

Drawing: Value studies in charcoal. Local color and relative value. Bone shapes are rendered as 3-dimensional forms with charcoal pencil. Class Critique

Week 4

Biology: **Fieldtrip:** Hunt Botanical Library.

Drawing: **Fieldtrip:** Hunt Botanical Library.

Week 5

Biology: Fungi, with an emphasis on their role as environmental recyclers and their symbiotic partnerships with other organisms.

Drawing: Students collect mushrooms and fungi and make spore prints. Mushrooms shapes are sketched as bisected circles in perspective. Discussion of linear perspective as it relates to rounded forms. Blackboard diagrams and readings. The bisected circle in space, ellipses, schematic diagrams and cross sections.

Drawing: **Slide Lecture:** *Visual Parallels in Art and Science.*

Week 6

Biology: Lecture Exam One

Drawing: Students sketch a single species of seashell and closely observe subtle variations within that species using a dissecting microscope. Mark-making studies in pen and ink.

Week 7

Biology: Photosynthesis, food webs, and the basic plant structure in relation to how plants function.

Drawing: Students sketch specific plants from the Biology Department greenhouse collection and research how other artists have illustrated these plants.

Drawing Slide lecture: *Great Natural Science Illustrators: A visual chronology of Botanical, Biological, and Medical Illustration*

Week 8

Biology: Basic flower structures and their relationship to different pollination mechanisms.

Drawing: Plant drawings continued. Students compose a plant illustration using a combination of observation and visual research. Cross sections and detailed parts analysis. Midterm quiz of vocabulary terms.

Week 9

Biology: Insects and other arthropods, with an emphasis on what features make the insects the most successful and species rich group of higher organisms on the planet.

Drawing: Markmaking and the rendering of surface textures using insects from the Biology Collection. Value scale studies of textures with graphite pencil. Midterm Critique.

Week 10

Biology: Fish, with an emphasis on life in an aquatic environment.

Drawing: Texture studies continued using the fish collection. Forms are rendered in chiaroscuro using variations in textural markmaking in pencil.

Week 11

Biology: Amphibians and Reptiles, with an emphasis on life in a terrestrial environment.

Drawing: Live animals are sketched from the reptile room.

Week 12

Biology: Lecture Exam Two

Drawing: Students prepare reptile/amphibian/fish illustrations using a combination of observation and visual research. Forms are rendered in pen and ink.

Drawing Slide Lecture: *Animal Drawings and Nature Painting, from cave art to contemporary art*

Week 13

Biology: Dinosaurs, Fossils, and Birds, with an emphasis on how fossil and other information demonstrates a link between dinosaurs and birds.

Drawing: Students sketch preserved bird specimens in the Biology Department Museum.

Visiting artist: A bird-sculptor will talk about his career as a professional bird-carver and show examples of his carvings.

Week 14

Biology: Mammals, including Humans and other primates.

Drawing: All students participate in the hanging of a class exhibition of biological illustration.

Drawings are completed, photographed, and mounted and labeled with appropriate scientific names.

Week 15

Biology: Lecture Exam three.

Drawing: Final Quiz on vocabulary and perspective theory. Final critique conducted at exhibition site. Portfolios due.

Week 16

Biology: Final cumulative lecture exam.

Drawing: Exam: final drawing of an insect specimen from observation in pen and ink.

E. Teaching Methodology:

1) Traditional Classroom Methodology

This is a turn-taught lecture and studio-lab course, with half of the students in biology lecture one day, and half in the studio-lab instruction another day. During the second class period of the same week the two classes will switch from lecture to studio-lab, and vice-versa. In addition to lectures and studio drawing, course material will be presented through research assignments, homework assignments, slide lectures, illustrated natural history, reading assignments, quizzes, class discussions, oral presentations, visiting artists, critiques, and exams. Students will also conduct independent research at the library, through the internet, with cameras, and other visual resources. Students will take a fieldtrip to the Hunt Botanical Library. All students will participate in an exhibition at the end of the semester.

2) Online Methodology N/A

F. Text

Recommended: Jastrzebski, Zbigniew. *Scientific Illustration: A Guide for the Beginning Artist*. Englewood Cliffs, N.J.: Prentice-Hall, 1985. ISBN: 0137959311

G. Assessment Activities

Traditional Classroom Assessment

Grading: The final grade for the course will be divided equally between the grade point average of Biology and Drawing assignments.

Biology: Student work is assessed through: 1.) Grade point average of weekly homework assignments, a semester long project, an oral presentation, three lecture exams, and a comprehensive final exam.

Drawing: Student work is assessed through: 1.) Grade point average of class-work, homework, quizzes, exams, oral presentations, and participation in class discussion and critique.

1) Online Assessment

N/A

H. 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>

I. 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 EEEEO, 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.

Supporting Literature: Suggestions for Further Reading

Bethke, Emil G. *Basic Drawing for Biology Students*. Springfield, Ill., Thomas. (American Lecture Series, Pub.# 746), 1969.

ISBN: 0398001480

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

ISBN: 0486249905

Blunt, Wilfred and Stearn, William T. *The Art of Botanical Illustration*. Woodbridge, Suffolk: The Antique Collector's Club, 1994.

ISBN: 0486272656

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

ISBN: 0688032001

Council of Biology Editors. *Illustrating Science: Standards for Publication*. Bethesda, MD: The Council. 1988

ISBN: 0914340050

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

ISBN: 0517696290

Dowden, A.O. *From Flower to Fruit*. Ticknor and Fields, New York. 1994.

ISBN: 0395689449

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

ASIN: B00196LFDO

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

ISBN: 3791333275

----- *Art Forms in Nature*. New York: Dover Publications, 1974.

ISBN: 0486229874

Hodges, Elaine R.S., et al, Editors. *The Guild Handbook of Scientific Illustration*. Van Nostrand, 1989

ISBN: 0471360112

Holmgren, Noel H., and Bobbi Angell. *Botanical Illustration: Preparation for Publication*. Bronx, N.Y. New York Botanical Garden, 1986

ISBN: 0893272728

Jastrzebski, Zbigniew. *Scientific Illustration: A Guide for the Beginning Artist*. Englewood Cliffs, N.J.: Prentice-Hall, 1985.

ISBN: 0137959311

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

ASIN: B000MXFWZI

Knappe, Karl-Adolf. *Durer: The Complete Engravings, Etchings, and Woodcuts*. New York: Harry N. Abrams, Inc., 1965 .

ASIN B001G803L6

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

ASIN: B001ROMT3E

The Notebooks of Leonardo Da Vinci. New York: Dover Publications, 1970

ASIN: B001MANDJM

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

ISBN: 1858943000

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

ISBN: 0689120168

McAlpine, Daniel. *The Botanical Atlas: A Guide to the Practical Study of Plants*. New York: Smithmark, 1989.

ISBN: 0831774959

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

ISBN: 068415496X

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

ISBN: 2080135163

Schwenk, Theodor. *Sensitive Chaos: The Creation of Flowing Forms in Water and Air*. Translated by Olive Whicher and Johanna Wrigley. London: Rudolf Steiner Press, 1965.

ISBN: 1855840553

Sowerby, G.B. *Shells of the World*. London: Bracken Books, 1996

ISBN: 0517021994

Thompson, D'Arcy. *On Growth and Form*. Cambridge: Cambridge University Press, 1990.

ISBN: 0521437768

West, K. 1983. *How to Draw Plants: The Techniques of Botanical Illustration*. Watson-Guption Publications. New York.

ISBN: 08811923508

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

ISBN: 0881923729

Wood, Phyllis. *Scientific Illustration: A guide to biological, zoological, and medical rendering techniques, design, printing, and display; with a chapter on computer graphics by Patrick McDonnell*. New York: Van Nostrand Reinhold, 1994.

ISBN: 0471285250

Zomlefer, Wendy B. 1994. *Guide to Flowering Plant Families*. University of North Carolina Press, Chapel Hill.

ISBN: 0807844705

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

ISBN: 0226997014

Additional Information for Course Proposals

J. Proposed Instructors:

Mark Tebbitt, PhD (Biology) and Maggy Aston (Art and Design)

Alternates: Brian Paulson, PhD (Biology) and Laura Defazio (Art and Design)

K. Rationale for the Course:

This is a course intended for Freshman students, particularly those in the fields of science, art, anthropology, forensics, nursing, and sports medicine. At the beginning of their undergraduate studies, these students will acquire skills in close visual observation that will be applicable to all of these disciplines. Learning to sketch, as well as draw technical diagrams, will be of practical value to science, anthropology, and forensics students who may require drawing skills in research and fieldwork when photographs are unsuitable for recording complex observations. Slide lectures will also 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 out further connections between the disciplines, or possibly pursue the field of scientific illustration as a career path. Currently, there are very few institutions nationally that offer this type of cross-disciplinary study, potentially making it an attractive recruiting tool for California University of PA.

L. Specialized Equipment or Supplies Needed:

Lecture:

Projector or SMART board

Studio-Lab:

SMART board, (with viewing room that can be darkened for slide projection.)

Portable or table easels for drawing larger specimens

Wall onto which drawings can be tacked or taped for critique

Access to copy machine for enlargements.

Occasional use of compound microscopes and dissecting microscopes

Pencil Sharpener, wall mounted

M. Answer the following questions using complete sentences:

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

Yes or No?

Work-study students may be needed to drive mini-vans on fieldtrips. Aside from this, the course does not require any additional human resources.

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

Yes or No?

The studio section will be moving between 211 Old Main and Frich 411.

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

Yes or No?

No, it does not.

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

Yes or No?

No, it does not.

5. How often will the course be taught?

The course will be offered once a year.

Select the intended timing of the course.

[Click here to add text to qualify your selection for course timing, if necessary.](#)

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

Yes or No?

No, it does not.

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

- O. 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 because it combines the disciplines of Fine Arts and Natural Science. The course was written specifically with the intention of offering it on the General Education Menu because the field of scientific illustration is cross-disciplinary.

This course is intended for Freshman and will be of benefit to students in all three Colleges, particularly those in the fields of science, art, anthropology, criminal justice, forensics, nursing, sports medicine, and education.* At the beginning of their undergraduate studies, these students will acquire skills in close visual observation that will be applicable to all of these disciplines. Learning to sketch as well as draw technical diagrams will be of practical value to science, anthropology, forensics, and education students who may require drawing skills for teaching, as well as for research and fieldwork when photographs are unsuitable for recording complex observations. Slide lectures will expose students to visual parallels in art and science, in addition to various methods of scientific illustration. This initial experience may cause students to seek out further connections between the disciplines, or possibly pursue the field of scientific illustration as a career path. Currently, there are very few institutions nationally that offer this type of cross-disciplinary study, potentially making it an attractive recruiting tool for California University of PA.

From the perspective of classroom teaching, it will relieve instructors of General Botany and General Zoology from the complication of having to mix students with little or no

training in the sciences with biology majors and honors students. Similarly, it will allow drawing instructors to focus on the observational and technical skills necessary for beginners, without allowing for the range of personal expression expected by more art advanced students. Also, students who have no drawing experience may feel less intimidated by the prospect of finding themselves in a class with a majority of art majors, some of whom have been drawing for many years.

* As STEAM education is now a federal mandate for secondary education, it is especially important for education students to understand how art can be integrated into other disciplines, not only in terms of art history, but also as observational drawing skills useful for the study of science and the natural world.

Yes or No?

P. Approval Form

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

Listed on the chart below are the objectives of the Natural Science and Fine Arts menus along with justification for the inclusion of this course on the menu.

Natural Science Objectives	Justification for including the course on the Natural Science menu
To identify major concepts in natural science disciplines, which provide insights into the breadth of those disciplines and their relationship to other disciplines;	Students will identify the characteristics of good quality science, and learn the basic methodology by which biological science is conducted. Students will distinguish the major groups of living organisms.
To illustrate the relationship between models, experiments, theories, and laws;	Students will illustrate the modern system of biological classification and the basic rationale for this system through written and oral reports and exams.

<p>To illustrate the generation and testing of data;</p>	<p>Students will collect data and record observations on a particular organism studied over an extended period.</p>
<p>To apply concepts and knowledge to the solution of problems; and</p>	<p>Students will summarize and contrast the basic modes of nutrition, patterns of reproduction, life cycles, ecology, morphology, anatomy, growth, and economic importance of a diverse range of living organisms.</p>
<p>To analyze and evaluate the limitations of collected data and design possible alternative interpretations.</p>	<p>Students will research and deliver an oral and written presentation summarizing their basic observations on a particular organism that was studied over an extended period.</p>
<p>Fine Arts Objectives</p>	<p>Justification for including the course on the Fine Arts menu</p>
<p>To present, critique or analyze human values, beliefs, and emotions as they are conceptualized, formulated, and expressed through verbal and physical action and artifacts and perceived through the senses;</p>	<p>Students will: 1.) explore visual parallels in art and science. 2.) become familiar with well-known works of natural history illustration and nature painting; 3.) Participate in group critiques in which students give and receive criticisms to and from peers. 4.) present an oral research report on the work of a natural science illustrator; 5.) experiment with different approaches to illustration through a variety of rendering styles; 6.) develop technical skills in the manipulation of drawing media;</p>

	7.) construct the elements of a composition according to design principles.
To attend and react to a performance or exhibit related to the discipline studied.	Students will organize an end of semester exhibition of original biological illustrations drawn from observation, and they will critique works as part of their final exam.

Laboratory Courses

Four criteria have been established for laboratory courses. ALL four criteria must be reflected in the course syllabus.

A laboratory course should emphasize discipline-specific methodologies and logic used to systematically investigate the world.

A laboratory course should provide students with the opportunity to use the methodologies and models of inquiries specific to their discipline in the selection, definition, solution, analysis, and evaluation of problems/questions independently and/or collaboratively.

A laboratory course should include the evaluation and assessment of student performance from the laboratory experiences.

A minimum of 30 percent of instruction time and 30 percent of the final grade of a course must be devoted to laboratory activities in order for the course to be considered for the laboratory component menu of general education. [Specific discipline is relative to the course and not to the student's discipline of study.]

- O. Attach Approval Form.

Additional Guidelines

The following are additional guidelines that you must follow which will expedite your course proposal. Failure to follow these guidelines will result in the return of the proposal to the department.

1. Be sure that your proposal is in the correct format (Guidelines for New Course Proposals) and that all questions have been completely answered.

2. Be sure that you have completed and attached the Application to Establish a New Course form and that the appropriate signatures have been affixed.

3. Be sure that you include an updated advisement sheet for any course that is being required by the department or is classified as a restricted elective. In addition, you must include copies of the current advisement sheet(s) with your proposal. Be certain that all advisement sheets affected by the proposed course change be included with your proposal. A short memo indicating the changes to the advisement sheet(s) and rationale must be attached.

4. When submitting materials for consideration by the Curriculum Committee, you must provide 20 copies of each item to be reviewed to the Chairperson.

5. All completed items must be in the hands of the Chairperson of the Curriculum Committee a minimum of one week prior to the next regularly scheduled meeting.

6. All courses that are to be dual listed must include the rationale.

7. Any department requesting a course name change must also submit a course number change as well. Submit this request on the Application to Establish a New Course Form.

8. New advisement sheets, major proposals, minors, or changes to advisement sheets will become effective the fall semester following committee approval. **The advisement sheets must also include the committee approval date at the bottom and the effective date on the advisement page.** Submit this request on the Advisement and / or Program Changes form.

9. New courses will become effective the semester following committee approval.

10. Any references listed must be in the appropriate bibliographic format for the discipline.