

### The Art and Science of Light, Fall 2007

**Faculty:** Dharshi Bopegedera (physical chemistry), Susan Aurand (studio art, art history)

“Art and Science of Light” is a one-quarter, interdisciplinary study of light. We will explore light in art, science, art history and culture, examining how humans have thought about light and seeing for the past 3,000 years. Students will do studio work exploring drawing, color, sculpture and experimenting with light as a tool in creating photographic images. They will explore the interaction of light with matter in the classroom and in the laboratory. We will focus on helping students build basic skills in both art and lab science, as well as library research and expository writing skills. Students will have the opportunity to do an individual or collaborative project on a topic of their choice related to the theme of light. The projects will integrate both art and science.

**Background:** No prior experience in art and science is needed. Students must be eager learners willing to integrate art and science in their explorations of light. High school algebra will get you through.

**Fall Quarter Schedule: First meeting – Monday (9/24) at 9.00 a.m. in Sem II C1107**

Monday	Tuesday	Wednesday	Thursday
9:00-11:00 Program Meeting, Art Critique, discussions, & Lectures Sem II C 1107	9:00-11.00 Studio Work Sem II E 4107	9:00-12:30 Science Lectures Sem II B 1107	9:00 –11:00 Science Labs Lab II, 1241 <b>OR</b> Studio Work Sem II E 4107
12:00 –2:00 Art Critique, Seminar, Films & Lectures Sem II E 4107	12:00 – 2:00 Studio Work Sem II E 4107	1.00 Open studio time OR Governance	11.30 - 12.30 Lab Report Writing Lab II, 2211 <b>OR</b> 12.00 – 2.00 Studio Work Sem II E 4107
			2.00 –3.00 Computer Skills

- **The “Text”:** Seeing the Light: Optics in Nature, Photography, Color Vision and Holography by Deiter R. Brill, David G. Stork, David S. Falk **ISBN:** 0471-60385-6
- **The “Reader”:** Catching the Light: The Entwined History of Light and Mind by Arthur Zajonc **ISBN:** 0195-09575-8

**Student Fee:** \$20 (paid to student accounts) covers the cost of materials for objects you will build and for tickets to the Seattle Art Museum.

**Organizing your work:** You are expected to organize your work in four different “folders”. Faculty may ask for these at any time during the quarter.

- **Art portfolio** (minimum size 18” x 24”)
- **Project/Art Binder** [1.5” ring binder for reading notes, art lecture notes and individual project work]
- **Lab notebook** (to be purchased from **Evergreen Bookstore only**)
- **Science Binder** [1” ring binder for lecture notes and homework in science]

**Credit distribution (subject to change):**

Science of Light with Laboratory - 4  
 Introduction to Drawing - 4  
 Humanities - 2  
 Art History - 2  
 Independent Project on Light - 4

## Art Workshops & General Instructions

Faculty: Susan Aurand

Times: Instruction – Tuesdays 9.00-2.00

Required Studio- Non-lab Thursdays (see schedule) 9.00-11.00 and 12.00 - 2.00

Space: Sem II 4107 unless otherwise stated (see schedule for fieldtrip, Week 6 and photoworkshop, Week 7)

### GENERAL INSTRUCTIONS

1. Please come to all workshops with the stipulated necessary art supplies (check syllabus each week to see what will be needed). You may store supplies in our space, 4107. Be sure to have with you each week your sketchbook, drawing pad and a pen or pencil for taking notes. Wear clothes that you can get dirty.
2. Arrive 10-15 minutes before 9:30 so you can be set up and ready to work right at the start of class. We will begin promptly at 9:30

### STARTING SUPPLIES LIST:

- 2 Drawing pencils –one HB, and one 4B or 6B; **or** two “Ebony” pencils
- 2 Charcoal pencils – one 4 B and one 2H
- Small pencil sharpener
- Sandpaper stick (pieces of sand paper attached to a small flat stick)
- 2 Tortillons or “smudgers”, (medium and small size) (sticks of tightly twisted paper used to blend drawings)
- Staedler mars plastic eraser (hard white eraser)
- Staedler eraser holder (retractable stick eraser in plastic holder)
- Large Kneaded eraser (comes wrapped in plastic, like a chunk of grey putty) –
- Package of Vine or willow charcoal - medium
- 3-4 sticks of compressed charcoal (General brand is good)
- 3-4 sticks of General white charcoal or white conte (not white pastel chalk)
- 2 bull clips or 2” binder clips (cheaper) (for attaching paper to easel – a must!)
- ruler or straightedge and scissors or matt knife
- artist’s tape, masking tape or blue painter’s tape
- Small portable Sketchbook (small enough to carry with you easily everywhere) ; could be as small as pocket size, or a composition book, etc.
- 14” x 17” Sketch or Drawing pad, 60 or 80 lb weight. (eg. Strathmore brand)
- Plastic art box or tackle box with handle for carrying supplies

### SUPPLIES YOU WILL NEED TO BUY LATER IN THE QUARTER- RECOMMENDED TO WAIT FOR INFORMATION IN CLASS

- Box of 12 Nupastel brand colored pastels, oil pastels **or** basic set of Acrylic paints ( \*\*We recommend waiting to buy this until Susan presents information on types and brands)
- Photo paper for photo workshop
- Kaliedoscope/Optic boxes individual supplies
- Portfolio (18” x 24” minimum size) with handle for carrying and storing works

## Science Lectures and Labs – General Instructions

**Faculty: Dr. Dharshi Bopegedera**

**Science Instructional Technician: Peter Robinson**

**Student Aide: James Fennewald**

### Lab Times:

- Thursdays 9.00 – 11.00 (alternating weeks for Groups A and B) in Lab II, room 1234
- Report writing: Thursdays 11.30 – 12.30 (alternating weeks for Groups A and B) in Lab II, 2211

### General Instructions

1. You are required to purchase the lab notebook published by Laboratory Notebook Company. **This is available in the TESC bookstore.** Do not purchase any other lab notebook. All your lab work should be done in your lab notebook.
2. You are required to wear long pants (long skirt is acceptable provided it covers up to your ankles) and covered shoes to the lab. You are required to have a lab coat or lab apron (aprons are cheaper than coats) and goggles. You will not be permitted into the lab without proper lab attire.
3. It is your responsibility to print out the lab write-up from the program web page, read the instructions, complete the pre-lab assignment and bring it to class. You will not be permitted to enter the lab otherwise.
4. Completed lab notebooks should be submitted to the box outside Lab I, Room 2006 (Dharshi Bopegedera's office) by 8.45 a.m. on the Monday following your lab day, in. **Late work will not be accepted.**
5. There are no make-up labs. If you miss a lab, you will lose credits. If you miss a lab please contact your faculty as soon as possible.
6. Use a pen only (any color except red) for report writing (no pencils in the lab). If you make a mistake, do not erase or white out. Cross it off with your pen. Your written work should be neat and clean. When writing your answers to questions use complete sentences and use your own words. You may use a pencil for diagrams.
7. When reporting quantitative information, pay careful attention to units and significant figures.
8. Credit will not be awarded unless you complete each lab to the instructor's satisfaction. You may be asked to re-do lab reports if it does not meet the standard.
9. If you used any references, cite them clearly.
10. In addition to this, you are expected to maintain a "science binder" (one inch ring binder is recommended) to keep your reading notes, homework etc.

## Guidelines for Independent Student Projects

Your individual project is an opportunity to tailor a significant portion of your work to explore your own specific interests within the general theme of Light. Your project must be approved by the faculty and must combine scientific and artistic study **in a balanced way**. To document your on-going project work throughout the quarter, **you must keep a three-ring Project/Art Binder (1 or 2" suggested – see further information below) that contains all notes, reprints, sketches, reflections, and so on that you gather in connection to your project**. Your project binder will be reviewed regularly by the faculty. When researching your project, be sure to **carefully record all the sources of your information (including page numbers) as you gather it**, to save time at the end in compiling your bibliography!

One page, typed proposal of your project topic is **due on Monday, October 15 (Week 4) at Work Discussion**. Your proposal should include:

- a statement of your proposed topic
- a preliminary reading list or bibliography
- a short description of how you plan to integrate creative and scientific work

Your creative work may be in any medium. You should plan to focus in a single medium in order to develop your technical skills to the greatest extent possible in the time available. Your scientific work may take the form of library research, but preferably will include a **demonstration** component. Our text, *Seeing the Light*, contains numerous practical project ideas that you might use. The scientific study portion of your project could be in any scientific area. Your creative and scientific work should inform and enhance each other, giving you a truly interdisciplinary understanding of your project topic.

### Project/Art Binder

**Your Project Binder must have these separate sections:**

- Project –Your individual project notes, reprints, etc. pertaining to your project
- Readings - Your reading notes and worksheets from CTL (Reader) and STL (Text) and other assigned readings
- Lectures - notes from Monday art and history lectures
- Essays - all of your essays.

### Examples of Possible Student Projects

- Anamorphic (optical distortion) art
- Optical illusions
- Long exposure photography
- The electron microscope
- Pinhole photography
- Luminous tubes (neon, etc)
- Bioluminescence
- Photosynthesis
- Lightning
- Solar power
- Kirlian photography
- Color or light therapy in psychology
- Holograms
- Sundials
- Color perception in humans or animals
- The optics of shadows
- Magic with mirrors or lenses
- Fiber optics
- Wave mechanics/interference patterns
- Telescopes or other optical devices
- The chemistry of paint
- Interference and luminescent paints
- Polarization
- Lasers
- The emission spectra of elements
- Dyes
- The light bulb
- Global light pollution
- Phototropic behavior in plants
- Light and physical health in humans

## Reading List for the "Art and Science of Light" Program, Fall 2007

Text: *Seeing the Light* by Falk et. al.

Reader: *Catching the Light* by Zajunc

All other books are identified by title and author

Reading materials from other books will be provided in class

Readings are due by Monday of the assigned week

week	Text	Reader	total pages (approx)
1	Chapt 1	Excerpt from <i>Pilgrim at Tinker Creek</i> by Dillard	40
2	Chapt 2	Chapt 1, 2, 3	100
3	Chapt 3 (pages 72-91)	Chapt 4	58
4	Chapt 5		30
	Chapt 7 (pages 181-196)		
5	Chapt 8	Chapt 5	60
		<i>Total Eclipse</i> by Dillard	
6	Chapt 15	Chapt 6	81
7	Chapt 4 (pages 132-141)	Chapt 7, 8	85
		<i>Schrodinger's Cat</i> by Le Guin	
8	Chapt 9	Chapt 9, 10	70
		<i>Direction of the Road</i> by Le Guin	
9		Chapt 11,12	45

**Art and Science of Light, Fall 2007**  
**Faculty-Student Covenant**

**General Expectations:**

Students and the faculty in this program are expected to participate in the program activities in a spirit of goodwill. Every individual is expected to be considerate of how his/her actions affect the learning environment of others. Should problems arise, they must be resolved in a direct and timely manner. Complaining to others and nursing resentments in private does not help or solve problems. Cooperative work is highly valued in this program. Students, when directed to work in teams, are required to do their part and be supportive of team members. Evaluation of group work will be based on each individual's contribution to the effort of the team. Team members may be asked to provide written evaluations of each other. When reporting joint work, students are required to indicate personal contributions and give credit to their co-workers. Students' work should be in his/her own words and he/she should be ready to elaborate their work further, if asked. **Students are expected to be punctual for all program activities and are required to be active participants.** The faculty will be responsible for delivering course material and for evaluating student work in a timely manner.

**Evaluations and Awarding of Credit:**

Credits must be earned by completing the assigned work to the satisfaction of the faculty. The following are the minimum criteria for awarding credits.

- Submit all completed assignments on time. **Late work will not be accepted.**
- Submit all your work in an organized manner for evaluation at the end of each quarter.
- Submit a self evaluation and a faculty evaluation (for each faculty member) promptly at the end of the quarter.
- Meet with the faculty for a formal evaluation conference at the end the quarter.

**Faculty Evaluation of Students:**

Students will regularly receive feed back from the faculty. There will be an informal evaluation conference during week 5. At the end of the fall quarter students will receive a written evaluation at the evaluation conference where the evaluation will be discussed. This evaluation may or may not be changed as a result of this discussion. Your evaluation will be based on completion of all required work and the **quality of your work.**

**Student Evaluation of Faculty and Self Evaluations:**

Students are required to write an evaluation of each of the faculty at the end of the quarter. These evaluations may be given to the faculty member during the evaluation conference or to the program secretary prior to the evaluation conference. A student will not receive credit until his/her self evaluation and faculty evaluations are submitted.

**Resolving Conflicts:**

Conflicts can arise in a program. The first step toward resolution should always be to directly engage the parties involved face-to-face (student-student, student-faculty). Especially in group work, you might need to discuss issues such as team cooperation, sharing duties equitably and so on. If necessary faculty will act as mediators, but only if necessary. If the unusual situation of a serious conflict should arise we will try to resolve it within the program first, and only involve outside parties if absolutely necessary. We will follow the grievance procedures in the Evergreen's Administrative Code if needed.

Evergreen's Social Contract presents a "guide for civility and individual freedom". It also states where to find the Student Conduct Code and other policies. You are expected to read, understand and abide by the Evergreen's Social Contract and the Student Conduct Code.

A student may be asked to leave the program if his/her behavior is disruptive to the learning environment of others and/or to the progress of the program. A student who is asked to leave and wishes to appeal may do so by arranging a meeting with the faculty. The decision made at this meeting will be binding. The usual avenues of higher appeals in the college will remain open.

**Acceptance of Agreement:**

The program faculty will assume that by your continued registration in the "Art and Science of Light" program, that you have read, understood, and agree to be bound by the covenant outlined by this document. You are required to sign this document in order for you to receive credit in this program.

Student's name (please print): \_\_\_\_\_

Student's signature: \_\_\_\_\_