

Catalogue Code: ARCH 447

Course Title: Electrical Services - Lighting

Department: Architecture

Term: Fall 2007

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Location: Room 212, Thursday 10:30-12:30
Credits: 2
Prerequisites: none

Office hours: By appointment

Date: September 6, 2007

Term Project:

Option 1: Mini

In this project, groups of three students will work with high efficiency light sources to develop a prototypical luminaire, which is in sympathy with the detailing, material choice, and light distribution of the studio project currently being designed. Choice of sources is limited to CFL (compact fluorescent sources). Basic "building block" sources will be provided. You will be working in groups of three students.

The first step of this project entails drafting a clear statement of objectives which describes the envisioned context for the luminaire. Is this a large fixture designed for a commercial space, with robust construction and easy maintenance, or a delicate small scaled luminaire designed for a residential application? Quality, color, size, distribution, and mounting must all enter into the initial equation. Other issues to consider are:

- Is this fixture modular? Can it be used in multiple configurations (ie as a pendant, wall sconce, and table lamp?)
- How can this fixture be manufactured? Is it suitable for mass market? Consult with our visiting professionals and gather information during field trips.
- How does the fixture cater specifically to the energy efficient source specified?
- Both of the energy efficient sources require peripheral power source "modules" (drivers and ballasts). Have provisions for integrating this hardware been made?

Once your source choice and direction is approved by the instructors, you will give an initial presentation of the project in class on November 1st. Based on your feedback from this initial presentation, you will carry out a more detailed design analysis and present your results in a report and a second presentation during the end of term exam period (date to be determined). Please provide the following four deliverables:

- (1) Oct 18: a short proposal for your clients (a.k.a. design studio instructors) to sign off on (PDF one pager)
 - (2) Nov 1: initial oral presentation (30% of final mark, PDF)
 - (3) Exam period: final presentation and simulation report (50% of final mark, 2 PDFs)
 - (4) One week following crit: post mortem analysis (10% of final mark, email)
- * The remaining 10% of your final mark for this course are reserved for your participation in in-class exercises.

Please note: The last three documents (the proposal, client report and presentation) should visually "go together" and form a complete package. Consider your graphic and organizational approach with this in mind.

Guideline for Proposal (one pager)

Describe your objectives and the driving context for the fixture. Your "client" could be a building owner, another designer, etc.. Remember to provide a project name and the names of all involved students, in addition to your team number. The team number will be assigned once you have submitted the names of all students on the team.

Scenario: describe the project, and the relationship between you and your client

Objective(s): what do you want to do?

Methodology: how do you intend to do it?

Guideline for Client Report

In this project, unlike the "micro" and "macro" projects, the emphasis is placed on building a life size, functional prototype. There are a number of steps the team must complete and document on their way to building their final prototype. The team must provide the following. Note, you are in no way confined to limiting your investigation to these steps:

- Initial cross comparison ("pro or con" or matrix format) of available source choices
- Textual material photoboard of materials considered, rejected and selected, itemizing the material properties, ie: workability, transparency, fire resistance, cost, availability, etc...
- Photographs of light and material interaction.
- Photographs of initial ½ scale fixture built in cardboard or other material. This may be supplemented with computer models that may have helped generate the form, but cannot be supplanted.
- ½ scale dimensioned drawings showing assembly and suggested mounting condition.

Completed prototypes must be submitted at the same time as the report. It must be plug and play, including cord/plug and switch, and have provisions for mounting in the situation it was designed for. This implies if your fixture is a desk lamp, it must sit on the desk; if it is a wall sconce, it must screw into a wall (bring your own "wall panel " if necessary); if it is a pendant, provide a hanging mechanism and long enough power cord.

Guideline for Presentations

- Initial Presentation: present your design proposal; be prepared for questions
- Final Presentation: same message and content as client report; present your prototype (make sure it lights up!); be prepared for questions based on the effectiveness of your chosen strategies.

Guideline for Post Mortem Analysis

Wherever you are going to work, the ability to manage your time will be an asset. You should therefore develop the habit of tracking the time you spend on any given project using a log book. Do not overdo it. This is supposed to be a helpful tool. Estimate in hour units how much time you have spent and what you have accomplished using the form below. After you have delivered your presentation, use the log book to write a brief analysis of how much time you have spent on the project, where (in retrospect) you could have saved time, and which parts of your report you might reuse in other projects in the future. All in all, this should take no more than 30 minutes and might be a useful exercise for the future.

Post Mortem Form

1st Phase: Project scoping	comments	hours
- refine project constraints		
- learn software		
2nd Phase: Initial design		
- prepare computer model		
- assemble the data		
- formulate design recommendations based on simulation results		
- prepare and deliver first presentation		
3rd Phase: Design development		
- redefine project scope (based on initial feedback)		
- refine computer model(s)		
- carry out daylighting analyses and determine success of each variant		
- assemble the data and formulate design advice		
4th Phase: Prepare final deliverables		
- write report		
- prepare final daylighting analyses at high resolutions		
- prepare and deliver second presentation		