LIGHT FIXTURE DESIGN OR RETROFIT

Author Diana Wilson Morrow
University of Tennessee
Room 230, Jessie Harris Building
Knoxville, Tennessee 37996-1900

Keywords Fixture Design, Retrofit

Category Lighting and Color
Type Class Assignment
Level Junior
Duration 2 Weeks

Abstract Students were required to design a light fixture or retrofit an existing fixture. Students used community resources to seek technical assistance for the wiring, material selection and fabrication of the fixture.

Objectives
- To apply knowledge of lamp and luminaire function, selection and evaluation;
- To develop an understanding of basic wiring techniques; and
- To practice creative selection and use of materials in the design and construction of a fixture.

Criteria

Students designed, constructed, and wired a fixture; or retrofitted an existing fixture. Existing fixtures could be antiques or newer fixtures in need of repair or updating.

The retrofit option required students to rewire the fixture. Additionally, students could restore, refinish, or replace components such as the base or shade.

The fixture was to be designed for a specific use.

The fixture was to be safe. Use of all components were required to follow manufacturer's instructions.

Use of energy efficient lamps, such as compact fluorescent and halogen, was encouraged.

Students conducted a self-evaluation of the completed fixture.

Process

Phase One

Students selected a lamp (bulb) type to be used, determined how the fixture was to be used, and began to develop ideas.

Checkpoint-conceptual sketches.

Phase Two

Students identified local sources of materials and technical assistance, and

made initial contacts. Such research was an integral part of developing the refining the fixture design.

Checkpoint-proposed design approved by the instructor.

Phase Three

Students built or retrofitted the fixture. They provided the following information on a 4" x 6" notecard: 1) intended fixture use; 2) listing of materials and costs; 3) fabrication techniques used, i.e., metal or glass cutting and polishing, soldering, or woodworking, etc.; and 4) an evaluation of the fixture.

Presentation

Fixtures were presented to the class and photographed by the instructor. A slide show of the fixtures provided additional opportunity for discussion and evaluation.

Evaluation

The fixtures were evaluated using the following criteria:

Function (suitability for intended use).....25%
Creative use of materials.....25%
Application of correct wiring
technique/safety 25%
Craftsmanship..... l5%
Self-evaluation..... l0%

Note

The cost of the materials for the projects varied among students from under $10 to over $150, with the average around $60. Students were encouraged to work within their own budget, and were reminded that expense of the fixture was not a part of the grading criteria.

Resources

Field trip to a lighting showroom;
Introductory lectures on electricity, basic wiring, light control, lamp and luminaire selection, and light measurement;
Presentation by a fourth year student; and
Local resources, (lighting companies, electricians, hardware and hobby stores, building material suppliers, metal fabrication shop, glass company, antique shops, and flea markets.)

Credits

Mr. Walter Moran, retired Associate Professor and Dr. Josette Rabun, Associate Professor, University of Tennessee, have required lighting students to design fixtures in previous years. Consistently it has been a project that generates much excitement among the students who are involved. Given the opportunity to instruct this year's lighting course, the author developing this project followed these professors example.

Documentation Lamp design by third-year student Christine Long.