

A. INSTRUCTION

4. Professional Core Course Curriculum Development

This discussion will examine one course in which the candidate achieved significant contributions to the curriculum. The course is ID 551 Industrial Design Manufacturing Materials and Processes - U3, taught in the Autumn Quarter.

ID 551 Industrial Design Manufacturing Materials and Processes - U3
Autumn 1989, 1990, 1991, 1992, lecture/lab GTA support

The course is a core course required of all majors in the Department of Industrial Design. The candidate teaches the only section in Autumn with usually one GTA. All of the students meet once a week for lecture. The group is split into two lab sessions, which meet once a week. The involvement of the GTAs is focused on the lab session activities.

The candidate designed major revisions to the course curriculum during the preceding quarter. The revisions developed two fundamental changes in the curriculum. First, to link subject matter to each of the major areas, and second, to tie the curriculum to a new coursepacket, created by the candidate.

Traditionally, the course has provided satisfactory subject matter associated with the Interior Space and Product Design majors. However, the Visual Communication Design has received less than adequate subject matter associated with its major.

a. Development of Curriculum

The course subject matter is an overview of the necessary knowledge associated with properties and fabrication principles of materials used in visual communication, interior space and product design. Its purpose is to bring all students to an equal level of knowledge for use in their studio courses. The instructor defined two core subject matter issues for the course: materials and processes.

Because the course is required of all majors in Industrial Design, the subject matter of the course needs careful development. The information needs for each of the three majors differs. This is due to the type of design work with which each becomes involved. Both the Interior Space and Product Design majors work with a wide range of materials and processes. However, the Visual Communication Design (VCD) major is more focused on paper products and printing processes. Recently, the VCD profession has expanded its involvement to include polymers for packaging. Still, a fundamental question arose regarding the information needs for VCD majors. An answer comes from understanding the educational philosophy of the department. Briefly, the department views the three majors as acting in concert within both the educational and the professional context. There is considerable overlap in the design work in which each becomes involved. While the normal material and process information needs of VCD majors is more focused, the latent need is as demanding as the other majors.

To resolve the issue of subject matter with equality for the three majors, the instructors designed seven units of content. The seven units were organized to cover fiber type materials, then polymers, metals and end with ceramic materials. The units included: Introduction to Principles of Materials and Processes; Wood and Finishes; Textiles; Paper and Printing; Polymers; Metals; and Ceramics. Due to the extensive range of information involved with the content, the candidate carefully tailored the subject matter to suit the needs of the Industrial Design majors.

This need to tailor information also led to the other concern in development of the subject matter. The second major revision, designed by the candidate, resulted from the lack of an adequate textbook(s) for the course. Some existing course packet material, developed by Prof. Virginia Weinhold, was available. However, the inclusion of additional material provided necessary information to supplement lectures and lab sessions. The candidate developed much of this additional information over a number of years at a previous institution.

The candidate divided the subject matter for each content unit between the lecture and the lab session. The lecture covered: introduction of material subject; introduction of process subject; definition of terminology; and discussion of application. The lab sessions provided hands-on opportunities for the students: examples of materials, demonstration of processes, discussion of application; and student exercises to explore application.

The course objectives therefore become: to introduce students to the properties of natural and man-made materials used by designers, engineers, and architects, from a technical viewpoint; to introduce students to the wide range of modeling and production materials available, from an applications viewpoint; and to provide a setting for contact with material experts from industry and academic disciplines who will appear as guest lecturers during the quarter.

Based on the defined subject matter and objectives, the candidate developed more detailed subject matter and concepts.

b. Curriculum Contributions and Innovations

Together with the GTAs, the candidate designed a number of contributions and innovations to the curriculum to enhance the student's ability to make decisions about material and processes when they design.

Designed Curriculum to Enhance Student Understanding of Material and Process Interrelationships for Designers

Important to the student's decision making process was their understanding of the interrelationships between desired results, material properties, and processing the material. While the students did not need to have the same level of understanding as a mechanical engineer or a material scientist, they needed to understand the language and terminology of these professionals. Designers need to think of materials and their processing as an artist thinks about paint or clay. As a medium to develop creative ideas. Design students need to understand the impact a material choice will have on their ideas.

Designed Instructional Methods to Enhance Student Understanding of Material and Process Interrelationships for Designers

The candidate used a variety of instructional methods to establish the interrelationships between desired results, material properties, and processing the material. First, introduction of the character of the interrelationship through lecture. Readings in the course packet also supported the lecture. Next, guest speakers, who were experts in the application of a class of materials, provided additional insight. Then in the lab sessions a variety of exercises further reinforced the student's experience with how to make decisions with a material. Finally, each

student conducted research into the application of material and process for a specific design, prepared a written report of the decisions made and the results.

Developed Instructional Materials to Enhance Student Understanding of Material and Process Interrelationships for Designers

In planning the course the candidate prepared a series of course packet materials on Manufacturing, Processes, Materials overview, Material Properties, Metals, Woods, Plastics, Ceramics and various processes.

The candidate showed a series of videotapes of last years guest speakers including: of our department, Prof. Kimberly Elam, discussing paper and Prof. Virginia Weinhold, discussing textiles; plus other academics, manufacturing and design professionals, Steve Platner, Hennegan Printing, discussing printing processes; Gregg Davis, Design Central, discussing plastics application; Hank Gudrian, Quantum Chemical Co., discussing plastics materials; Ken Jupp, Wilsonart, discussing high pressure laminates. Together, these guest speakers provided a broad overview of all of the material groups and the major attending

Student requirements include readings, lab exercises, exams, and a written research report. During the labs the candidate and GTAs worked with the students to explore the materials with short exercises in wood, paper, textiles. metal, and plastic. In addition, a quarter project was devised to require teams of students to locate, analyze and disassemble a product system of their choice. Each team was required to prepare a visual report for presentation.

Utilized New Technologies to Deliver Subject Matter

To improve the delivery of subject matter during lectures the candidate utilized a computer presentation system with video data projection during lectures in University Hall Room 14. The candidate solely created the visual presentations. The content of materials and processes for designers lends itself very well to combined graphic and text presentations. The computer software used, Persuasion, allows significant flexibility for the rapid creation of effective presentations. Very current information can be included. Abstract concepts can be communicated with greater success, especially those belonging to dynamic processes.