COURSE OUTLINE

Glaze Calculation Art 195

I. Catalog Statement

Art 195 - Glaze Calculation - 3 Units

Prerequisite: Art 187 or Art 191.

Note: This course may be taken 4 times; a maximum of 12 units may be earned.

Art 195 is an introduction to basic glaze and clay calculations. The students learn to calculate molecular weights, molecular glaze formulas, and batch recipes. Students use general glaze theory with calculating procedures to analyze and substitute (or create from the beginning) glazes and clay bodies. The course involves simple arithmetical computations and includes certain ceramic laboratory skills and safety precautions for handling chemicals. This course prepares the vocational student for employment in the ceramic industry.

Lecture 2 hours, studio 2 hours.

II. Course Objectives

The student will be able to:

- 1. Evaluate unknown clays for their working properties
- 2. Calculate the chemical analysis of a glaze
- 3. Design a specific glaze for a predetermined function
- 4. Analyze line blends of glazes
- 5. Calculate molecular formulas for glazes

III. <u>Text</u>

<u>The Craft and Art of Clay</u>, 4th Edition, Susan Peterson, Laurence King Publishing, 2003.

<u>Clay and Glazes for the Potter</u>, Daniel Rhodes, Third Edition

Revised and Expanded by Robin Hopper, Krause Publications, 2000.

The Complete to High -Fire Glazes, John Britt, Lark Books, 2007.

Periodicals:

Ceramics Monthly

Studio Potter

Clay Times

IV. Course Outline

A. Introduction and Orientation

5 hours

- 1. Course content and management of the class
- 2. Geology, elements, minerals, rocks, compounds
- 3. Oxides in umf, mole percent, and weight percent.
- 4. Clay bodies

B. Unknown clay

5 hours

- 1. Testing an unknown commercial clay
- 2. Compare data with known clay to identify unknown clay

C. Calculations 16 hours

- 1. Calculating a chemical analysis of a glaze or feldspar and finding the unity molecular formula of all given materials
- 2. Calculating a batch recipe in related weights from a unity glaze formula expressed in molecular equivalents
- 3. Calculating the molecular formula of a glaze from a batch recipe for a glaze

D. Glaze materials

3 hours

- 1. Basic glaze materials
- 2. Basic types and uses
- 3. Exceptions to the rule

E. Test clay

10 hours

- 1. Designing and preparing a basic west coast clay and formulating a stoneware clay
- 2. Measuring shrinkage at cones 06, 10
- 3. Water of plasticity, water absorption at maturing temperature
- 4. Making adjustments for defects

F. Test glaze

10 hours

1. Basic types of glazes

- 2. Designing and executing test of the glaze by using calculation procedures
- 3. Aesthetic surface qualities
- 4. Glaze fit to clay body
- 5. Making adjustments for any glaze defect
- G. Color line blend

10 hours

- 1. Metallic oxides and colorants in high or low fire glazes
- 2. Testing a number of oxides in test glazes
- H. Deflocculating

5 hours

- 1. Use of deflocculants in glazes and casting slips
- 2. Use of flocculants.

V. Examination/Evaluation Procedures

A written test will be given after each calculation topic:

- 1. Elements, molecular weights
- 2. Unity molecular formulas
- 3. Mole percent and oxides by weight percent.
- 4. Batch recipes
- 5. Colorants and general glaze information

Grades will be based primarily on the completion of the projects, test scores, individual participation in class discussion, the glaze report, and attendance.

VI. Special Features

A comprehensive glaze report is required, showing the glaze recipe, unity molecular formula, technical details, comments on all color work, and a thorough evaluation of the glaze, including suggestions for modification and additional research.