

**COURSE OUTLINE****Glaze Calculation  
Art 195****I. Catalog Statement**

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 student for employment in the ceramic industry.

Total Lecture Units: 2.0

Total Studio Units: 1.0

**Total Course Units: 3.0**

Total Lecture Hours: 32.0

Total Studio Hours: 32.0

**Total Faculty Contact Hours: 64.0**

Prerequisite: Art 187 or Art 191 or equivalent.

**II. Course Entry Expectations**

Skill Level Ranges: Reading 5; Writing 5; Listening/Speaking 5; Math 2

Prior to enrolling in the course, the student should be able to:

1. create wheel thrown ceramic vessels of at least 6" in height or width;
2. create wheel thrown lidded forms with at least two different types of lid fittings;
3. create multiple forms from one piece of clay ('throwing off the hump');
4. create forms by assembling separately thrown parts;
5. apply surface design to pottery forms by methods such as sgraffito;
6. glaze pottery forms by a variety of techniques including wax resist and oxide design;
7. identify the differences between low temperature and high temperature clays;
8. identify the coloring oxides used in high temperature ceramic glazes and explain their individual functions;
9. formulate and test a high temperature glaze;
10. explain the differences between oxidation and reduction firing procedures;
11. report in writing on ceramic design techniques;
12. evaluate their work and that of others through group oral critiques.

Or

1. analyze, design, and construct sculptural, functional, and architectural ceramics;

2. evaluate ceramic constructions through individual and group critiques;
3. compare and contrast ceramic constructions from historical and contemporary sources;
4. integrate surface design into their ceramic constructions;
5. load and fire kilns.

### **III. Course Exit Standards**

Upon successful completion of the required coursework, 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.

### **IV. Course Content**

**Total Faculty Contact Hours = 64**

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|--|-----------------|
| A. Introduction and Orientation  | Lecture 6 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  | Lecture 3 hours |
| 1. Testing an unknown commercial clay  | Studio 3 hours  |
| 2. Compare data with known clay to identify unknown clay   |                 |
| C. Calculations  | Lecture 8 hours |
| 1. Calculating a chemical analysis of a glaze or feldspar and finding the unity molecular formula of all given materials | Studio 8 hours  |
| 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   | Lecture 3 hours |
| 1. Basic glaze materials   |                 |
| 2. Basic types and uses  |                 |
| 3. Exceptions to the rule  |                 |
| E. Test Clay   | Lecture 2 hours |
| 1. Designing and preparing a basic west coast clay and formulating a stoneware clay                                      | Studio 10 hours |
| 2. Measuring shrinkage at cones 06, 10   |                 |
| 3. Water of plasticity, water absorption at maturing temperature   |                 |
| 4. Making adjustments for defects  |                 |

- F. Test Glaze Lecture 4 hours  
Studio 4 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 Lecture 4 hours  
Studio 4 hours
1. Metallic oxides and colorants in high or low fire glazes
  2. Testing a number of oxides in test glazes

- H. Deflocculating Lecture 2 hours  
Studio 3 hours
1. Use of deflocculants in glazes and casting slips
  2. Use of flocculants.

**V. Methods of Instruction**

The following instructional methodologies may be used in the course:

1. classroom lectures and demonstrations;
2. instructor analysis of student work;
3. peer analysis of student work;
4. individual instruction of students.

**VI. Out of Class Assignments**

The following out of class assignments may be used in this course:

1. students are assigned lab practice time (e.g. students test glaze formulations to build experimental and analytical skills);
2. notebook portfolio (e.g. students create a portfolio documenting their glaze test results).

**VII. Methods of Evaluation**

The following methods of evaluation may be used in this course:

1. quizzes after each major topic;
2. evaluation of student glaze testing assignments;
3. students complete a mid-term and final written examination.

**VIII. Textbooks**

Peterson, Susan and Peterson, Jan. *The Craft and Art of Clay: A Complete Potter's Handbook*. Laurence King Publishing, 2012. Print.  
11th Grade Textbook Reading Level. ISBN: 978-1856697286

**IX. Student Learning Outcomes**

Upon successful completion of the course the student will be able to:

1. calculate glazes from a unity molecular formula;
2. demonstrate familiarity with ceramic materials.