

ART 195 - GLAZE CALCULATION

COURSE SYLLABUS

INSTRUCTOR: [ROGER PORTER](#)

PREREQUISITE: [ART 187](#) OR [ART 191](#)

COURSE DESCRIPTION:

This class is offered to provide art students with the basic concepts of technical ceramics and familiarity with ceramic materials and basic body and glaze calculations. It prepares vocational students for employment in the industry. The prerequisite is Art 187 or Art 191. Art 195 gives three hours credit and may be repeated once for a total of six hours credit. The usual sequence for this course is two hours of lecture, a break, and two and a half hours of lab time, which may include demonstrations, work on lab assignments, reporting of experiment results, class discussions, and exams. A technical report of the glaze work including calculation is required as well as oral presentation of experiment results. Outside time is required both for the lab assignments and for preparation of the report. Technical reports are required for two clay bodies, as well as oral presentation of experiment results, and two written glaze calculations. Outside time is required both for the lab assignments and for the calculations

TEXT:

CLAY AND GLAZES FOR THE POTTER by Daniel Rhodes, Third Edition Revised and expanded by Robin Hopper, available at the College Bookstore. Reading assignments in the text will be made each week for the following week.

MATERIALS LIST:

Required are a battery operated calculator of reasonable size with memory and constant capability, a dust mask, and one black underglaze pencil. In time, each student will need at least six lidded containers and four 8 oz. specimen containers. All items are available at the College Bookstore. A minimum of twenty-five pounds of clay will be required to make the test pieces.

LABORATORY MATERIALS FEE:

There will be many glazes and other materials provided to you for use in glazing and firing your pottery. The lab materials fee will pay for all glazing and firing costs. This fee will be discussed fully by your instructor, but basically you have two choices:

1. Purchasing a laboratory materials voucher from the College Bookstore. This voucher entitles the student full access to our studio glazes, glaze chemicals, and firing. Vouchers will be passed out at the first class meeting, filled out by the student, and taken to the Bookstore for payment and returned to the instructor by the next class meeting.

OR

2. If you choose not to purchase the voucher, you will not be allowed to use studio glazes or glaze chemicals, and must purchase your own from ceramic supply houses. By purchasing our glaze materials in large quantity, we are able to reduce the cost to you significantly with the lab materials voucher. A full list of the available glaze chemicals and firing supplies provided by the voucher may be viewed by clicking on [CHEMICALS LIST](#).

LOCKERS:

Lockers are available in the hallway outside the lab. You provide your own lock, find an empty locker, put your lock on it, and then sign the locker sign-up sheet in my office. See the lab assistant to sign up. Failure to sign the locker list will result in your lock being cut off! This is done to ensure that only art students use the lockers.

LABORATORY HOURS:

You are welcome and encouraged to use the open lab hours we provide. These hours are exactly that, lab hours, uninstructed. This is valuable time you will need to complete your projects required in the class. Four hours minimum per week in addition to class time seem necessary if you wish to have any real success. If your schedule does not permit such a time commitment you might find the class difficult and unrewarding. Lab hours are as follows. Please note, however, that on Tuesdays from 5:45 to 10:30pm the Ceramic Studio is reserved for members of Art 195. Glaze calculation class members are asked to limit their activities on Tuesdays to work on projects for that class.

Monday-Thursday: 8:00am to 10:30pm

Friday: open alternate Fridays 8:30am-4:00pm

Saturday and Sunday: Closed

LAB RULES:

The Ceramic Studio rules will be given to each student along with a copy of this syllabus at the first class meeting. Failure to abide by the studio rules may result in dismissal from class.

HOW TO REACH ME:

My office phone number is 818-240-1000 ext. 5543. I can be reached at this number Monday-Thursday 5:45-10pm. My email address is:

rporter@glendale.cc.ca.us

INTERNET:

The GCC Ceramics Department may be accessed on the World Wide Web at

<http://www.glendale.cc.ca.us/ceramics/>

Course syllabi, faculty profiles, lecture handouts, demonstration handouts, and a student art gallery may be viewed by clicking on highlighted words to view the linked pages.

ART 195

GRADING POLICY

TESTS AND GRADING PROCEDURES:

Three exams are given (during lab time), and a comprehensive final will be given the last meeting. Failure to take the final will result in a failing grade for the course. The final grade is calculated as follows: 50% lab, 10% each exam, and 20% final. A is 90-100, B 80-89, C 70-79, D 60-69, and below 60 is failing. If an exam is missed because of illness, a makeup is given by arrangement the following week. Only one exam can be made up. More than two consecutive absences or persistent tardiness will result in the student being dropped. Glendale Community College has a policy on Academic Honesty, available in the college catalog. Incidents of plagiarism will be referred to the Vice-President of Instruction.

SEMESTER CALENDAR

ART 195

WEEK 1 - Administrative details. Course syllabus. Studio rules. Brief discussion of subject matter and lab work. Working with glazes and some of the difficulties. Basic chemistry, chemical symbols, the periodic table, compounds. Atoms, molecules, atomic and molecular weights.

WEEK 2 - Review of mathematics and basic terms in ceramics and geology. Oxides in ceramics. Introduction to clay, clay minerals, accessory minerals, and clay calculations. Clay classification. Kaolinite structure. Flocculation and deflocculation of clay slips. The Lab assignments with due dates and exam dates.

WEEK 3 - Calculation of a molecular formula from a typical analysis of a clay. Clay bodies and clay body classification. Drying and firing of a ceramic body. Testing clays and clay bodies. Calcined clay. Engobes. Slip glazes. Terra sigillata. Cones.

WEEK 4 - Oxides in ceramics reviewed. Ceramic raw materials except for colorants. Poisonous and dangerous materials. Eutectics. Introduction to glazes. Nature of glass and glaze and how one differs from the other. Brief comments on the antiquity of glazing. Types of glazes and glaze classification.

WEEK 5 - The RO system and the functions of various oxides in the glaze. The unity molecular formula. Raw material analysis and the calculation of a ceramic formula and formula weight from the analysis. The calculation of a recipe from the unity molecular formula of a glaze.

WEEK 6 - The calculation of the unity molecular formula from a glaze recipe. The calculation of a glaze in oxides by weight percent from the unity molecular formula. Calculation of a unity molecular formula from the chemical analysis of a glaze.

Mole per cent. Introduction to frits.

WEEK 7 - The composition and calculation of frits. Glaze calculation involving frits. Multiple complex materials. Silica levels and limit formulas. The $\text{Al}_2\text{O}_3/\text{SiO}_2$ ratio. Eutectics in glaze making.

WEEK 8 - Glaze surfaces. Opacity. Amount of water. Common glaze additives, other than colorants. Brushing glazes. Suspension problems. Glaze flocculation and deflocculation. Glaze development.

WEEK 9 - Glaze color. Raw colorants. Simple and complex blending. The effect of glaze composition on colorants. The effect of firing on colorants. Unusual and rare oxides.

WEEK 10 - Ceramic glaze stains and the basics of manufacture. Types of stains. Limitations. Effect of glaze composition and firing on stains. Colored slips. Body color and body stains. Inclusion pigments.

WEEK 11 - Decoration in ceramics. Terminology and definitions. Underglaze, inglaze, and onglaze. Majolica. Mishima. Slip painting.

WEEK 12 - Oxidation and reduction glazes. Cadmium-Selenium glazes. Specialty glazes. Unusual effects. Double coats. Once fired glazes. Dyes. Crystalline glazes.

WEEK 13 - Use of computer programs in glaze calculation. Cost of various ceramic raw materials and colorants. Expansion coefficients for various oxides. Use of computer programs to predict glaze expansion. Glaze expansion and contraction. Effect of colorants on expansion.

WEEK 14 - Glaze and body faults. Lead and cadmium release. Simple quality tests. The barium controversy. Changing conditions in ceramics. Final questions and answers.

WEEK 15 - Comprehensive final examination.

