NEW YORK CITY COLLEGE OF TECHNOLOGY DEPARTMENT OF
THE CITY UNIVERSITY OF NEW YORK RESTORATIVE DENTISTRY

DEPARTMENT: DEPARTMENT OF RESTORATIVE DENTISTRY

COURSE CODE: RESD 2314

COURSE TITLE: DENTAL CERAMICS

CLASS HOURS AND CREDITS: 6 LABORATORY HOURS, 1 LECTURE HOUR PER WEEK; 3 CREDITS

NUMBER OF WEEKS: 15 WEEKS

CURRICULUM LEVEL: 3RD SEMESTER

PREREQUISITES: RESD 1215

COURSE DESCRIPTION: An introduction to the theory and practice of fabricating fixed porcelain prosthesis. Included is the design and construction of individual metal copings and the design and construction of multiple unit frameworks, investing, casting non-precious metals, application and firing of opaques, contouring and firing of porcelains, glazing and staining of individual and multiple unit bridges, crowns and jackets. A brief introduction to new technologies in ceramics eg, Milling Zirconia all porcelain. A discussion on infection control as it relates to ceramic restoration procedures.

TEXT BOOKS: Dental laboratory technology: fixed and special prosthodontics. (2005). Air Force Pamphlet 47-103,Vol. 2.

Introduction to Metal Ceramic Technology
Patrick Naylor, DDS, MPH, MS

Basic Technique for Metal Ceramics
Makoto Yamamoto

Updated 8/24

REFERENCES:

Dental Technology Reference for Fixed Restorations, J.F. Jelenko & Co. 1983

Color in the Human Dentition,

Robert Waltke, J.F. Jelenko Co., 1985

Science and Technology of the Cast Restoration, Hollenback, C.V. Mosby Co.

Dental Technology - Theory and Practice, R. Blakeslee, C.V. Mosby Co.

AUDIO/VISUAL TECHNICAL TAPES:

Investing, Casting, Metal Finishing, Pre & Post Soldering. Talladium, 1987. (VIDEOCASSETTE 463)
Porcelain Veneers. Practical Clinical Courses, 1987. (VIDEOCASSETTE 378)
Wax-Up Talladium, 1987 (VIDEOCASSETTE 642)
Porcelain Building: Five Surface Domain-Range Build-Up System. Talladium, 1987. (VIDEOCASSETTE 644)
Porcelain Finishing: Staining, Glazing, Corrections & Polishing. Talladium, 1987. (VIDEOCASSETTE 645)

Dental Laboratory Technology - Fixed Restorative Techniques, John Sowter, D.D.S. University of North Carolina, 1972.

COURSE REQUIREMENTS:

Standard college and department attendance and grade regulations. Conformity to safety regulation. Uniform laboratory gowns. Dental instruments and supplies.

OUTCOMES ASSESSMENT: Laboratory: **Laboratory Total of 60%**
13 laboratory assessment quizzes given in the first 10 minutes of meeting times worth
***Only 1 may be excused with advance notice .5 pts each*

			Lecture:	Quizzes	10 %
A	93 - 100%			Midterm	15%
A-	90 - 92.9%			Final Exam	15%
B+	87 - 89.9%			**Lecture Total**	**40%**
B	83 - 86.9%				
B-	80 - 82.9%				
C +	77 – 79.9%	D	60 - 69.9%		
C	70 - 76.9%	F	59% and below		

CONTACT INFORMATION: Office A-601H
Phone (718) 260-5137
Fax (718) 254-8557
Prof. Alter: dalter@citytech.cuny.edu
Prof. Reda-Szywala: Breda-Szywala@citytech.cuny.edu
Prof. Katy Peralta: Kperalta@citytech.cuny.edu

COORDINATOR: Revised August 2024, Daniel Alter, MSc, C.D.T., M.D.T.
Phone: (718) 260-5154
Office hours: Wednesdays 9:00 -11:00am or by appointment
e-mail: dalter@citytech.cuny.edu

ACADEMIC INTEGRITY

CUNY Policy on Academic Integrity

Academic dishonesty is prohibited in The City University of New York. Penalties for academic dishonesty include academic sanctions, such as failing or otherwise reduced grades, and/or disciplinary sanctions, including suspension, or expulsion.
Source: NYCCT College Catalog:
http://www.citytech.cuny.edu/academics/academiccatalog.aspx

NYCCT Academic Integrity

Students and all others who work with information, ideas, texts, images, music, inventions, and other intellectual property owe their audience and sources accuracy and honesty in using, crediting, and citing sources. As a community of intellectual and professional workers, the College recognizes its responsibility for providing instruction in information literacy and academic integrity, offering models of good practice, and responding vigilantly and appropriately to infractions of academic integrity. Source: NYCCT College Catalog:
http://www.citytech.cuny.edu/academics/academiccatalog.aspx

Restorative Dentistry

1. All Restorative Dentistry students must submit completed assignments or projects (in lab or theory) by the assigned due date as stated in the course outline.
2. Plagiarism in lecture or laboratory assignments, exams or projects will not be accepted. Student will not receive a grade if papers or assignments were done by someone else. The department will adhere and follow the Academic Integrity Policy and Procedures as per NYCCT & CUNY Policies.
3. Students are responsible for knowing all material covered in reading assignments and handouts for both lecture and laboratory. Students are responsible for knowing information from reading assignments regardless of whether it has been covered during class sessions or not.
4. RESD students are responsible for being in class on time and for participation in laboratory demonstrations. Failure to observe laboratory demonstrations may affect student's performance and contribute to the failure of the course.

ATTENDANCE

NYCCT Attendance & Lateness

Attendance and class participation are essential and excessive absences may affect the final grade. Courses with laboratory, clinical or field work may have specific attendance policies.
Source: NYCCT College Catalog:
http://www.citytech.cuny.edu/academics/academiccatalog.aspx

NYCCT Reasonable Accommodations

Qualified students with disabilities, under applicable federal, state and city laws, seeking reasonable accommodations or academic adjustments must contact the Center for Student Accessibility for information on City Tech's policies and procedures to obtain such services. Students with questions on eligibility or need for temporary disability services should also contact the Center at :
The Center for Student Accessibility, 300 Jay Street room L-237, 718 260-5143,
http://www.citytech.cuny.edu/accessibility/

Restorative Dentistry Professionalism & Participation

The Department of Restorative Dentistry follows NYCCT, CUNY and Dental Laboratory Technology industry standards in order to educate, develop, advance and guide future dental technology professionals, preparing graduates for workplace readiness. In order to successfully complete Restorative Dentistry courses, students must consistently participate in classes and meet deadlines as stated in course syllabus. To successfully complete Restorative Dentistry curriculum the students are required to observe course instructor's demonstrations and complete all fabrication tasks under

course instructor's supervision. Classes will begin promptly at the scheduled time. Laboratory demonstrations are usually conducted at the beginning of the session and cannot be redone for the convenience of a student who arrives late or is absent. When student is given instructor's permission to leave the class, the student will return to class in a reasonable time.

Students enrolled in RESD course must meet all course requirements as stated in course syllabus in order to pass it. RESD students must complete required assignments, tasks, projects and exams by specified due dates. Failure to submit or complete the assignment, tasks, projects or exam by specified due dates will result in a zero (0) grade and possible failure of the course. It is strongly advised that students are present for all classes during the semester including 30 laboratories and 15 lectures.

GRADING

Restorative Dentistry courses include didactic or didactic and laboratory sections which are graded accordingly. In didactic and laboratory sessions, the final grades will be computed based on grading included in course syllabus. Most courses are graded based on 60% of the laboratory and 40% of the lecture grades. Student must achieve a passing grade of at least 70% in the laboratory and at least 70% in the lecture sections of the course in order to receive the minimum passing grade of "C" for the entire course. Failure to meet the minimum of 70% average in either component of the course confirms that the student has not met the minimum requirements for successful completion of the course and a grade of "D" or "F" will be given based on student's performance in the failing section of the course. RESD student is required to repeat any RESD course for which he/she receives a grade below minimum of "C". For courses with laboratory and lecture components, the student needs to repeat both, the lecture and the laboratory sections, even though the score in one of the sections may have been greater than 70%.

RESD students will participate in the end of semester clean-up of the Restorative Dentistry dental laboratories. The date of final cleanup will be announced in advance. For students who are absent during final clean up, 5% of final grade will be deducted.

College grading scale A
= 93- 100%
A- = 90-92.9%
B+ = 87-89.9%
B = 83-86.9%
B- = 80-82.9%
C+ = 77-79.9%
C = 70-76.9%

D = 60-69.9%
F = 59.9% and below

SATISFACTORY PROGRESS

Students are expected to maintain 2.0 G.P.A. or higher in all classes. Students whose cumulative G.P.A. fall below the minimum 2.0 G.P.A. will be placed on academic alert or academic probation by the College. Students on academic probation may be subject to attempted credit restrictions which can affect progress in taking all courses needed for a semester. Failure to raise cumulative G.P.A. to the appropriate level could result in dismissal from the College.

Any students receiving a grade of "D" or "F" in a RESD courses will be required to repeat that course. RESD course may only be repeated once. Failure to satisfactorily complete a repeated RESD course will be considered failure to maintain satisfactory progress in the major and will result in dismissal from the major.

PROFESSIONALISM & ETHICS

1. Since practice of dentistry carries with it a high degree of responsibility, a mature, professional, and ethical conduct is expected of all students at all times (lecture & laboratory sessions, hybrid & online sessions, externship sites, professional events/seminars, etc.). Unprofessional behavior that shows inattentiveness and disrespect for others will be taken into consideration during the grading process. Points may be deducted at the discretion of any faculty member regardless of what course is in session. This includes incidents in the hallways, by lockers, or anywhere on NYCCT campus. Students will conduct themselves in a professional manner. No horseplay, offensive language, shouting or any other misconduct will be allowed.
2. Netiquette: Online Etiquette-Students will conduct their online posts and replies with respect for others, which include courtesy, dignity, and appropriate language at all times. Inappropriate behavior of any kind in online settings will not be tolerated and will negatively affect student's grade.
3. All faculty members will be addressed by their proper title.
4. Students are required to use proper dental terminology when discussing dental prosthesis.
5. Students are to have all required instruments and supplies when attending laboratory sessions.
6. Students are not permitted to do other students' work although assistance and teamwork are strongly encouraged.
7. All electronic devices must be turned off during all RESD classes unless otherwise specified by the instructor.
8. Each RESD student will be assigned a locker in the beginning of each semester and will vacate the locker by the last day of the semester. If the locker is not returned back in

clean condition by the end of the semester, the locker will be broken by CLT. The student will not receive another locker the next semester.

9. Students should make arrangements to attend all department events and professional development seminars in which an invitation is extended. Students are strongly encouraged to attend events, professional development seminars and meetings sponsored by the department to elevate their knowledge, skills and understanding of the field of study.
10. Department offices and stock rooms contain sensitive and personal information, classroom materials, supplies and equipment, and should be used for official use only. Students and unofficial personnel should not be allowed in the department offices unless to fulfill official business.

DRESS, SUPPLIES & TEXTBOOKS

1. Laboratory smocks (lab coats) with Restorative Dentistry Department emblem must be worn at all times in the laboratory. Emblems are to be attached to the left breast pocket. Smocks must be clean and kept completely buttoned or tied when worn. Failure to wear smocks will necessitate students being barred from laboratory and marked absent.
2. Closed-toe shoes are required while working in the laboratory.
3. No hats/caps of any type are to be worn in the laboratories. *(Except for religious reasons)*
4. Students must purchase and have in their possession the required tools, supplies, PPE and textbooks by the 2nd week of scheduled classes. A list of all course materials will be available in the department's main office or in CLT's office. All personal tools should be clearly labeled with student's name.
5. Students should acquire required textbooks for each course and are expected to read assigned pages and review procedures *prior* to attending lecture and laboratory classes. The list of required textbooks will be listed in all course syllabi.
6. RESD students are responsible for their belongings at all times. Restorative Dentistry Department does not take responsibility for left over items.

HEALTH & SAFETY

1. No eating, drinking or smoking is permitted in laboratories or classrooms.
2. No electronic devices (i.e. phones, headphones, computers or tablets) will be permitted in the laboratories or classrooms unless requested for classroom use by the instructor.
3. No outerwear, shopping bags, attaché cases, luggage etc., are permitted in laboratories.
4. Bunsen burners when lit are a potential danger. Bunsen burners must be turned off when you leave your bench. Long hair and hair spray are flammable items. Pay particular attention to any Bunsen burner flame. Do not lean over the open flame.

5. Chucks must be securely placed onto bench engine shaft to avoid chuck flying off when engine is turned on.
6. Boiling water can result in serious burns. Extra caution should be taken when boiling out or using boiling water.
7. Burnout furnaces and porcelain furnaces are potentially dangerous. Tongs should be used when picking up hot casting rings or ceramic work.
8. Students with long hair must wear a hairnet or tie back their long hair to prevent accidental burning from Bunsen burners or other serious accidents. Hair can easily get caught in hand piece or lathe.
9. Safety eye glasses must be worn by all occupants of the laboratory while any procedures are being conducted that produce dust or airborne particles. Safety eye glasses with side shields may be obtained from a hardware store. They are essential to the students' safety.
10. Eye protection measures should be taken when working with curing lights, lasers, and heating or melting metal.
11. Proper mask (N95) should be worn when grinding metals, ceramics, and acrylics or when using materials creating dust.
12. Students not enrolled in a RESD course, from this and other departments, will not be permitted to visit during laboratory sessions.
13. Students will not use any equipment until demonstrated by the instructor.

CLEANLINESS

1. Students must have a plastic place mat to protect bench top during laboratory sessions.

2. Students are required to clean-up working areas and equipment at the conclusion of any procedure. Timely clean-up is important to prepare the area for the next student and ensure equipment remains in working order. Especially important is that stone or investment is not allowed to harden in the sinks, in the mixing bowls or in contact with the equipment.

3. Each student is required to leave work station spotless by removing all debris, papers, wax, plaster, etc. from drawers, work station tops and floors in the immediate vicinity of the seat before leaving. In addition, each student will be assigned responsibility for maintaining the cleanliness of an area used in common by all members of the class. Also, equipment such as duplicating flasks, articulators or any other equipment issued by the instructor must be returned clean and in good working condition (5% of final grade).

4. RESD students will participate in the end of semester clean-up of the laboratories that will be scheduled in the morning after the last working laboratory class. 5% of final grade will be deducted for students who will not show up for the final clean up.

QUIZZES AND

EXAMINATIONS: Students are responsible for knowing all material covered in reading assignments, handouts, lecture and laboratory. Students are responsible for knowing information from reading assignments regardless of whether it has been covered during class sessions or not. There will be two examinations that will account for the majority of the lecture score (midterm and final). There will be one major quiz that will be scheduled for one lecture session. Laboratory quizzes will be given within the first 10 minutes of laboratory session and will assess content from the demonstration given by instructor.

GOALS AND OBJECTIVES
FOR RESD 2314: Upon successful completion of the course each student should be able to:

1. **Pour** a pindex model. Cut, trim and mark dies.
2. **Design** and **construct** metal copings
3. **Design** and construct multiple unit ceramic frameworks
4. **Describe** the physical properties of precious and non-precious alloys
5. **Apply** and fire porcelain
6. **List** the physical and thermal properties of porcelain
7. **Contour**, shape, stain and glaze multiple and individual unit crowns and bridges
8. **Describe** the factors that must be taken into consideration for porcelain support when designing different bridges
9. **Fabricate** a fixed ceramic restoration with a porcelain butt joint\margin in accordance to a given prescription
10. **Describe** the principles and methods of preventing disease transmission and cross contamination during the fabrication of ceramic restorations

General Education Student Learning Outcomes:

1. **Recognize** esthetic values in the dental environment 2.
Learn appropriate properties associated with dental ceramics
3. **Converse** using discipline specific vocabulary accurately.
4. **Read** and interpret professional scholarly journals

Assessment: The Professor will evaluate the students' achievement of the learning outcome by:

1. Giving multiple choice exams periodically throughout the semester.
2. Evaluate practical exams with emphasis on the student's ability to communicate.
3. Evaluate comprehension through manual dexterity projects in the Laboratory.
4. Evaluate lab work utilizing rubrics.

NEW YORK CITY COLLEGE OF TECHNOLOGY

DEPARTMENT OF
THE CITY UNIVERSITY OF NEW YORK RESTORATIVE DENTISTRY

RESD 2314 - DENTAL CERAMICS EVALUATION CRITERIA FOR FABRICATING CERAMIC RESTORATIONS

TOTAL

** 13 quizzes will be given during the first 10 minutes of laboratory sessions at the instructors' discretion. These quizzes will be to assess retention of laboratory demonstrations. Each quiz is worth 0.5 points out of 60. Only 1 quiz may be excused with advance notice. (6 PTS.)

APPLICATION AND FIRING OF PORCELAIN: (25 PTS.)
Building up porcelain, shaping of
Build-up posterior bridge (opaquing 2pts, opacious den. 3pts, dentin 5pts, incisal 5pts)
Build-up of Anterior Zirconia Bridge (Dentin 5pts, incisal 5pts)

CONTOURING, SHAPING, STAINING AND FINISHING: (25 PTS.)
Grinding contacts and anatomy: 20 pts (contacts 5pts, occlusion 5pts, carving 5pts) Applying glaze and stain: 5 pts (stain 1pts, glaze 2pts)

CLEANLINESS OF WORK AREA: (4 PTS.)

TOTAL 60%

CRITERIA FOR EVALUATION - LECTURE SESSION

QUIZ	10%
MIDTERM	15%
FINAL	15%
	40%
	TOTAL 100%

FINAL COURSE GRADE WILL BE COMPUTED ON THE BASIS OF 60% LABORATORY GRADE AND 40% OF EXAMINATION GRADES. EACH INDIVIDUAL'S PERFORMANCE WILL BE ASSIGNED A CONVENTIONAL LETTER GRADE. ALTHOUGH THE STUDENT MUST ACHIEVE A MINIMUM PASSING GRADE OF 70% IN THEORY AS WELL AS LAB, INDIVIDUALLY AND RESPECTIVELY TO SUCCESSFULLY PASS THE COURSE.

Please review the Academic Calendar for Class meeting Dates below:

Topic	Reading	Week of Wed.
POURING OF IMPRESSIONS, PINNING, ARTICULATING AND CAST PREPARATION	AFP 47-103 Vol II p14,28-39 AFP 47-103 Vol I p39-47	Aug. 28
WAXING OF COPINGS, SPRUING AND INVESTING	AFP 47-103 Vol II p121-135 Naylor p83-105	Sept. 4
CASTING, RECOVERY AND FINISHING,PRESOLDER	AFP 47-103 Vol II p105,71-88 Naylor p33-58	Sept. 11
Quiz		Sept. 18
METAL PREPARATION AND OPAQUING WITH BUTT JOINT PORCELAIN MARGIN	AFP 47-103 Vol II p131-135 Naylor p109-117, Yamamoto p9-18	Sept. 25
PORCELAIN BUILD-UP AND FIRING	AFP 47-103 Vol II 136-151 Naylor p141-169, Yamamoto p13-53	Oct.02
Midterm		Oct.09
CONTOURING, STAINING AND GLAZING	AFP 47-103 Vol II 156-160 Naylor p171-198	Oct.16
INTRODUCTION TO MULTIPLE UNIT WAXING	AFP 47-103 Vol II p136-138	Oct. 23
BRIDGE DESIGN	Naylor p61-80,119-139	Oct. 30

MULTIPLE UNIT SPRUING	AFP 47-103 Vol II p136-138 Naylor p83-105	Nov. 06
FRAMEWORK PREPARATION, PORCELAIN APPLICATION AND FIRING	AFP 47-103 Vol II p138-151 Naylor p61-80,119-139 Yamamoto p13-53	Nov. 13
FINISHING, GLAZING AND POLISHING	AFP 47-103 Vol II p156-163 Naylor p171-198 Yamamoto p57-116	Nov. 20
FINISHING, GLAZING, AND POLISHING	AFP 47-103 Vol II p156-163	Dec. 4
Final Exam		Dec. 11

NEW YORK CITY COLLEGE OF TECHNOLOGY

AUGUST 2024

Sunday	Monday	Tuesday	Wednesday	Thursday	Friday	Saturday
			AUGUST 28 **CLASSES BEGIN**	AUGUST 29	AUGUST 30	AUGUST 31 **NO CLASSES SCHEDULED**

SEPTEMBER 2024

Sunday	Monday	Tuesday	Wednesday	Thursday	Friday	Saturday
SEPTEMBER 1 **NO CLASSES SCHEDULED**	SEPTEMBER 2 **COLLEGE CLOSED**	SEPTEMBER 3	SEPTEMBER 4	SEPTEMBER 5	SEPTEMBER 6	SEPTEMBER 7
SEPTEMBER 8	SEPTEMBER 9	SEPTEMBER 10	SEPTEMBER 11	SEPTEMBER 12	SEPTEMBER 13	SEPTEMBER 14
SEPTEMBER 15	SEPTEMBER 16	SEPTEMBER 17	SEPTEMBER 18	SEPTEMBER 19	SEPTEMBER 20	SEPTEMBER 21
SEPTEMBER 22	SEPTEMBER 23	SEPTEMBER 24	SEPTEMBER 25	SEPTEMBER 26	SEPTEMBER 27	SEPTEMBER 28
SEPTEMBER 29	SEPTEMBER 30					

OCTOBER 2024

Sunday	Monday	Tuesday	Wednesday	Thursday	Friday	Saturday
		OCTOBER 1	OCTOBER 2 **NO CLASSES SCHEDULED**	OCTOBER 3 **NO CLASSES SCHEDULED**	OCTOBER 4 **NO CLASSES SCHEDULED**	OCTOBER 5
OCTOBER 6	OCTOBER 7	OCTOBER 8	OCTOBER 9	OCTOBER 10	OCTOBER 11 **NO CLASSES SCHEDULED**	OCTOBER 12 **NO CLASSES SCHEDULED**
OCTOBER 13	OCTOBER 14 **COLLEGE CLOSED**	OCTOBER 15 **CLASSES FOLLOW MONDAY SCHEDULE**	OCTOBER 16	OCTOBER 17	OCTOBER 18	OCTOBER 19
OCTOBER 20	OCTOBER 21	OCTOBER 22	OCTOBER 23	OCTOBER 24	OCTOBER 25	OCTOBER 26
OCTOBER 27	OCTOBER 28	OCTOBER 29	OCTOBER 30	OCTOBER 31		

NOVEMBER 2024

Sunday	Monday	Tuesday	Wednesday	Thursday	Friday	Saturday
					NOVEMBER 1	NOVEMBER 2
NOVEMBER 3	NOVEMBER 4	NOVEMBER 5	NOVEMBER 6	NOVEMBER 7	NOVEMBER 8	NOVEMBER 9
NOVEMBER 10	NOVEMBER 11	NOVEMBER 12	NOVEMBER 13	NOVEMBER 14	NOVEMBER 15	NOVEMBER 16
NOVEMBER 17	NOVEMBER 18	NOVEMBER 19	NOVEMBER 20	NOVEMBER 21	NOVEMBER 22	NOVEMBER 23
NOVEMBER 24	NOVEMBER 25	NOVEMBER 26	NOVEMBER 27 **CLASSES FOLLOW FRIDAY SCHEDULE**	NOVEMBER 28 **COLLEGE CLOSED**	NOVEMBER 29 **COLLEGE CLOSED**	NOVEMBER 30 **NO CLASSES SCHEDULED**

DECEMBER 2024

Sunday	Monday	Tuesday	Wednesday	Thursday	Friday	Saturday
DECEMBER 1 **NO CLASSES SCHEDULED**	DECEMBER 2	DECEMBER 3	DECEMBER 4	DECEMBER 5	DECEMBER 6	DECEMBER 7
DECEMBER 8	DECEMBER 9	DECEMBER 10	DECEMBER 11	DECEMBER 12	DECEMBER 13	DECEMBER 14 **LAST DAY OF CLASSES**
DECEMBER 15 **FINAL EXAMS**	DECEMBER 16 **FINAL EXAMS**	DECEMBER 17 **FINAL EXAMS**	DECEMBER 18 **FINAL EXAMS**	DECEMBER 19 **FINAL EXAMS**	DECEMBER 20 **FINAL EXAMS**	DECEMBER 21 **FINAL EXAMS**
DECEMBER 22	DECEMBER 23	DECEMBER 24 **COLLEGE CLOSED**	DECEMBER 25 **COLLEGE CLOSED**	DECEMBER 26	DECEMBER 27 **FINAL GRADE SUBMISSION DEADLINE**	DECEMBER 28
DECEMBER 29	DECEMBER 30	DECEMBER 31 **COLLEGE CLOSED**				

NEW YORK CITY COLLEGE OF TECHNOLOGY DEPARTMENT OF
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INSTRUCTIONAL OBJECTIVES DENTAL CERAMICS - RESD 2314 - LECTURE

I. POURING MODELS, PINNING, ARTICULATION AND CAST PREPARATION - ONE LECTURE HOUR

A. CONDITIONS: Given a lecture and discussion, using slides, visual aids, and reading assignments on the clinical and and laboratory procedures for pouring, pinning, articulating and preparing dies for waxing

B. PERFORMANCE: The student should be able to:

1. Differentiate between the different methods of constructing a coping
2. Describe under what conditions each method should be used
3. Name the various materials used for spruing
4. Describe proper application of the sprues
5. List the steps for the procedures for the investments Discussed

C. EXTENT & CRITERIA: With at least 70% accuracy at the end of one lecture hour.

II. WAXING OF COPINGS, SPRUING AND INVESTING - ONE LECTURE HOUR

A. CONDITION: Given a lecture and discussion using slides, visual aids, and reading assignments on the four methods of constructing a coping, types of spruing materials, various types of investment and methods of investing substructure designs and considerations, proper wax contouring considerations.

B. PERFORMANCE: The student should be able to:
1. Differentiate between the different methods of constructing a coping
2. Describe under what conditions each method should be used

3. Name the various materials used for spruing
4. Describe proper application of the sprues
5. List the steps for the procedures for the investments discussed.

C. EXTENT & CRITERIA: With at least 70% accuracy at the end of one lecture hour.

III. CASTING, RECOVERY AND FINISHING - ONE LECTURE HOUR

A. CONDITION: Given a lecture and discussion using slides, visual aids and reading assignments on the methods of casting, recovery finishing and soldering procedures

B. PERFORMANCE: The student should be able to:

1. List and describe all procedures for casting
2. Describe the various situations when oven burnout temperatures may differ
3. Describe the problems that may arise during casting
4. Describe various soldering techniques.

C. EXTENT & CRITERIA: With at least 70% accuracy at the end of one lecture hour.

* QUIZ

IV. METAL PREPARATION AND OPAQUING - ONE LECTURE HOUR

A. CONDITION: Given a lecture and discussion using slides, visual aids and reading assignments on metal conditioning, opaque application and firing of precious and non-precious alloy

B. PERFORMANCE: The student should be able to:

1. Describe the precious and non-precious conditioners
2. Describe the effects of conditioners on:
   a. physical properties of alloys
   b. bonding strength of porcelains and opaques
3. Describe opaque application techniques and the

firing cycle of opaques

C. EXTENT & CRITERIA: With at least 70% accuracy at the end of one lecture hour.

V. PORCELAIN BUILD-UP AND FIRING - ONE LECTURE HOUR

A. CONDITION: Given a lecture and discussion using slides, visual aids and reading assignments on porcelain application, condensing, physical properties, oven temperatures, firing cycles and thermal properties of porcelain

B. PERFORMANCE: The student should be able to:

1. Describe the step in building and condensing porcelain
2. List the physical properties of porcelain
3. List the thermal properties of porcelain
4. Describe the procedures for using the porcelain

C. EXTENT & CRITERIA: With at least 70% accuracy at the end of one lecture hour.

VI. MIDTERM - ONE LECTURE HOUR

VII. CONTOURING, STAINING AND GLAZING - ONE LECTURE HOUR

A. CONDITION: Given a lecture and discussion using slide, visual aids, and reading assignments on color blending, contouring, techniques of applying stains and glazes

B. PERFORMANCE: The student should be able to:

1. Describe the methods of using the color blending chart
2. Describe the techniques of applying stains to crowns
3. Describe the advantages and disadvantages of internal and external stains
4. Describe the advantages and disadvantages of natural and super glazing techniques

C. EXTENT & CRITERIA: With at least 70% accuracy at the end of one lecture hour.

VIII. INTRODUCTION TO MULTIPLE UNIT WAXING - ONE LECTURE HOUR

A. CONDITION: Given a lecture and discussion using slides, visual aids and reading assignments on coping and pontic design, occlusion, and porcelain support

B. PERFORMANCE: The student should be able to:

1. Give the reason for the use of different designs of copings and pontics in multiple unit castings
2. Compare the designs of different frameworks and their effects on occlusion
3. Describe the factor that must be taken into consideration for support design of bridges

C. EXTENT & CRITERIA: With at least 70% accuracy at the end of one lecture hour.

IX. BRIDGE DESIGN - ONE LECTURE HOUR

A. CONDITION: Given a lecture and discussion using slides, visual aids and reading assignments on bridge design, coping and pontic design and porcelain support structures

B. PERFORMANCE: The student should be able to:

1. Compare the different designs of bridges and their application to each particular case
2. Describe the factors that must be taken into consideration for porcelain support when designing different bridges

C. EXTENT & CRITERIA: With at least 70% accuracy at the end of one lecture hour.

X. MULTIPLE UNIT SPRUING, FINISHING AND PRESOLDERING - TWO LECTURE HOURS

A. CONDITION: Given a lecture and discussion using slides, visual aids and reading assignments on techniques of using runner bar sprues and auxiliary sprues for multi-unit casting and using slides, visual aids and reading assignments on finishing techniques of metal frameworks and investing frameworks for pre-soldering procedures

B. PERFORMANCE: The student should be able to:

1. List the different size sprues used in runner bar spruing
2. Describe the significance of runner bar spruing
3. List the reasons for using auxiliary sprues
4. List procedures for finishing multi-unit frameworks 5. Describe the procedure for investing a multi-unit bridge for pre-soldering
6. Describe the procedure for soldering a multi-unit soldering a multi-unit bridge
7. List the precautions that must be taken when soldering two parent metals to insure a strong connection

C. EXTENT & CRITERIA: With at least 70% accuracy at the end of two lecture hours.

IX. FRAMEWORK PREPARATION, PORCELAIN APPLICATION AND FIRING - ONE LECTURE HOUR

A. CONDITION: Given a lecture and discussion using slides, visual aids and reading assignments on framework preparation with conditioners and opaques, porcelain application, condensing and firing

B. PERFORMANCE: The student should be able to:

1. List the steps for applying conditioners and opaques to frameworks

C. EXTENT & CRITERIA: With at least 70% accuracy at the end of one lecture hour.

XII. FINISHING, GLAZING, AND POSTSOLDERING - TWO LECTURE HOUR

A. CONDITION: Given a lecture and discussion using slides, visual aids and reading assignments on porcelain finishing, glaze application, and firing, investing for post-soldering and post-soldering using the porcelain oven

B. PERFORMANCE: The student should be able to:

1. List and describe the procedures for finishing and glazing a multi-unit porcelain bridge

C. EXTENT & CRITERIA: With at least 70% accuracy at the end of two lecture hours.

XIII. FINAL EXAMINATION - ONE LECTURE HOUR
NEW YORK CITY COLLEGE OF TECHNOLOGY DEPARTMENT OF
THE CITY UNIVERSITY OF NEW YORK RESTORATIVE DENTISTRY

I. ARTICULATION AND CAST PREPARATION - THREE LABORATORY SESSIONS

CONDITION: Given a demonstration and reading assignments of preparation of maxilla and mandibular casts and using the following equipment and supplies:

II. FINISHING METAL FRAME WORK AND OPAQUING/ZIRCONIA BINDER - THREE LABORATORY SESSIONS

CONDITION: Given a demonstration and reading assignments on On finishing the metal substructure and preparing the zirconia frame work; subsequently, instructions on degassing, opaquing the metal substructure and placing binder on the zirconia

III. PORCELAIN BUILD-UP AND FIRING - TEN LABORATORY SESSIONS

A. CONDITIONS: Given a demonstration and reading assignments on procedures for mixing, applying and condensing body and incisal porcelains onto copings in the anatomical form of a tooth and firing crowns in a porcelain furnace to bisque state using the following equipment and supplies:

EQUIPMENT & SUPPLIES: 1. opaque copings
2. gingival and incisal porcelain
3. mixing slab and spatula
4. firing tray
5. #1 and #8 sable brushes
6. reeves carver
7. hemostat
8. porcelain furnace

B. PERFORMANCE: The student should be able to build porcelain on substructures (metal/zirconia)

C. EXTENT & CRITERIA: The following points will be evaluated:

1. The porcelain should be condensed and shaped into anatomical tooth form
2. The porcelain should be fired to the bisque stage

With at least 70% accuracy at the end of four sessions.

VII. CONTOURING PORCELAIN TO PROPER FUNCTION AND MORPHOLOGY - TEN LABORATORY SESSIONS

A. CONDITIONS: Given a demonstration and reading assignments on grinding and contouring of porcelain, contacts, bite, morphology, embrasures and occlusion, and firing to completion, with emphasis on color blending, correct anatomical form and using the following equipment and supplies:

EQUIPMENT & SUPPLIES: 1. bisque baked crowns
2. handpiece
3. assorted stones and wheels
4. ultrasonic cleaner
5. hemostat
6. porcelain stain kit
7. porcelain glaze kit
8. firing tray
9. porcelain furnace
10. metal polishing compounds
11. post solder

B. PERFORMANCE: The student should be able to grind, contour, stain and glaze crowns

C. EXTENT & CRITERIA: The following points will be evaluated:

1. The stain and glaze should be applied properly
2. The crowns should be color blended and fired to completion

With at least 70% accuracy at the end of two sessions.

XVII. FINISHING, GLAZING AND POLISHING - FOUR LABORATORY SESSIONS

A. CONDITION: Given a demonstration and reading assignments on finishing, applying glaze, firing, polishing metal and using the following equipment and supplies:

EQUIPMENT & SUPPLIES:
1. Handpieces
2. polishing compounds
3. rubber wheels and discs
4. glaze kit
5. porcelain oven
6. post solder

B. PERFORMANCE: The student should be able to finish and glaze a multiunit bridge

C. EXTENT & CRITERIA: The following points will be evaluated:

1. The bridge should be finished and glazed
2. The metal should be highly polished
3. The connection should be post soldered

With at least 70% accuracy at the end of three sessions