NEW YORK CITY COLLEGE OF TECHNOLOGY THE CITY UNIVERSITY OF NEW YORK

DEPARTMENT OF RESTORATIVE DENTISTRY

COURSE CODE:

RESD 1216

COURSE TITLE:

REMOVABLE PARTIAL DENTURES I (Writing Intensive)

RESD 121	6 Instructional Team		
Office:	P 409		
Phone:	(718) 260-5137		
Instructor:	Anthony Sena	Paul Federico	Justin Marks
Office	M 2:00-3:00	TBA	S 2:00-3:00
hours:	T 11:00-12:00 or by		
	appointment		
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COURSE DESCRIPTION:	An introduction to R.P.D. design and fabrication procedures. Course will cover: R.P.D. component terminology including various clasp design, surveying principles, design transfers, production of refractory casts, fabricating wax patterns, waxing, spruing, investing, burn-out, and casting techniques. Also, covered will be infection control techniques as they relate to R.P.D. fabrication procedures.
CLASS HOURS AND CREDITS:	6 Laboratory hours: 1 Lecture hour per week; 3 Credits
NUMBER OF WEEKS	15 Weeks
CURRICULUM LEVEL:	SECOND SEMESTER
PREREQUISITES:	RESD 1110, RESD 1111
TEXTBOOKS:	Dental Laboratory Technology – Basic Sciences, Removable Prosthodontics, and Orthodontics; Air Force Pamphlet 47-103 Vol. I
REFERENCES:	Dental Laboratory Procedures, Removable Partial Dentures, Rudd, Morrow, Rhoads, 1986, second edition, Vol. III, C.V. Mosby Co.
	Removable prosthodontic techniques, Sowter, J.B.; Barton, R.E., 1986, Chapel Hill: University of North Carolina Press
	McCracken's Removable Partial Prosthodontics, Carr, AB, Brown, DT, McCracken WL, 2016, Thirteenth Edition, St Louis, MO: Mosby.
	Dental Laboratory Technology, Nicholas Martinelli,1981, Third Edition, C.V. Mosby Co.
	Ney Surveyor Manual, Ney Co. Bloomfield, CT
	Removable Partial Dentures: a clinician's guide, Jones, John D., Dr. Garcia, Lily T, 2009, Ames, Iowa : Wiley-Blackwell
AUDIO/VISUAL TECHNICAL TAPES:	Partial Dentures, University of Iowa College of Dentistry, n.d. 2 videocassettes.(VIDEO CASSETTE 467).Revised January, 2018, Anthony Sena, CDT

Dental Technology Theory and Practice, Richard W. Blakesless, C.V. Mosby Co.

Partial Dentures (Part 1) Cast Metal Bases – Library Partial Dentures (Part 2) Cast Partials - Library Developing Wax Patterns, Removable Partial Dentures - H.S.R.C. Refractory Cast (R.P.D.) - H.S.R.C. Removable Partial Denture Design -H.S.R.C. Rotational Path Concept Partial Design 1 - H.S.R.C. Rotational Path Concept Partial Design 2 - H.S.R.C. Proper Placement of Lingual Bar - H.S.R.C.

POLICIES: 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/academic-catalog.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/academic-catalog.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.
- 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.
- 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/academic-catalog.aspx

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 a 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 15 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.
- 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

- 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. 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. In addition to the major quiz, there will be daily quizzes that will be conducted during the first <u>five</u> minutes of each lecture session, beginning the second lecture class. Daily quizzes will be based on prior lecture sessions and reading assignments that should be

completed prior to lecture. Students should be on time and in place prepared to take the daily quiz. Students who are not on time to class will not be permitted to take the daily quiz. There will be no make-ups for daily quizzes. The two lowest scores on the daily quizzes will be dropped.

LABORATORY REPORTS: Each student is responsible for preparing a laboratory report for each laboratory session. Prior to starting any laboratory session a prelaboratory plan should be accomplished stating your plan on what is expected to be accomplished during the laboratory session. MSDS information should be provided for materials that will be used during the laboratory session. During the laboratory sessions notes should be taken on observations made. Any measurement made should be recorded at the time of the laboratory. These records will be used to check for proper compliance with laboratory procedures. The post laboratory session

GOALS AND OBJECTIVES

FOR RESD 1216: The successful student will be able to, with a minimum of 70% accuracy:

- 1. Describe the principles and methods of preventing disease transmission and cross contamination during the fabrication of removable partial dentures
- 2. Identify the classification of cases using the Kennedy classification system and Word picture system
- 3. Identify and know the functions of the component parts of a removable partial denture including various clasp designs
- 4. Understand materials used in the dental laboratory and perform safe proper handling of materials.
- 5. Understand how to prepare models to be used for fabrication of Removable Partial dentures and apply proper techniques.
- 6. Articulate casts on semi-adjustable articulator. Evaluate occlusion and perform diagnostic set up of denture teeth.
- 7. Understand and perform principles of surveying and design
- 8. Accomplish an accurate design transfers. From diagnostic models to master models and from master models refractory models
- 9. Locate desirable and undesirable undercuts understand importance of each type of undercut. Block-out, and apply relief wax as necessary for R.P.D. fabrication.
- 10. Know and perform duplication procedures to produce refractory models and duplicate seating models using accurate techniques, recording procedures performed
- 11. Fabricate maxillary and mandibular R.P.D. wax patterns accurately and neatly.
- 12. Sprue and invest wax patterns, burnout and cast R.P.D. frameworks for the maxillary and mandibular arch.

General Education Goals:

- 1. Quantitative reasoning Students will utilize measuring instruments to obtain physical properties of materials; data will be applied in calculating information needed for accurate fabrication of dental appliances.
- 2. Writing Student's will write lab reports. Creating plan for laboratory activities, identifying materials to be used including safety precautions, recording laboratory observations including measurements taken and calculations of data. Accomplishments of laboratory sessions will be explained in report. In addition to the weekly laboratory reports there will be a lecture writing assignment in which an evaluation of an article related to Removable Partial denture design will be accomplished utilizing critical reading strategies.

- 3. Reading Students will be required to read literature on the theory and practice of fabricating dental prosthesis. Assignments will be given to aid in the comprehension and retention of information from assigned readings. Utilizing resources on critical reading strategies, students will accomplish a critical reading assignment stated in the previous goal.
- 4. Oral communication Students will be required to develop a professional vocabulary utilizing appropriate dental terms in communicating with fellow students and instructors.

Lecture Course Outline

(Tentative Schedule, subject to change)

Reading selections from: Dental Laboratory Technology, Air Force Pamphlet, 47-103, Vol. I & II (readings are from Vol I unless identified as from Vol II)

	Торіс	Reading	Assignment Due	Tuesday Class	Saturday Class
				Dates	Dates
1	Introduction to partial	p 361-364 , 387-390	Review Critical Reading	Jan. 30	Jan. 27
	dentures	p28-48 (2.19.3.4)	strategies resources		
		Vol II p 132 (2.8)			
2	Kennedy Classification	p 364- 369 p 441-443	Week 1 reading review	Feb. 6	Feb. 3
		p173-196	Using Vernier scale		
3	Partial Denture	p 436-441 p 386- 387	Review of Ratios	Feb. 13	Feb. 10
	components.		Week 2 reading review		
4	Clasping	p 369- 386	Week 3 reading review	Feb. 27	Feb. 17
			Kennedy Classification		
_			exercise		
5	Principals of Survey and	p 390- 436	Week 4 reading review	Mar. 6	Feb. 24
	Design	p 48(2.20)- 52(2.32)	Review Questions for Quiz		
6	Quiz	p 436-441, 444 - 449	Week 5 reading review	Mar. 13	Mar. 3
7				N 20	M 10
/	Designing Transfer		Week 6 reading review	Mar. 20	Mar 10
			Review Questions for		
0		450 454	Midterm	N 07	N 17
8	Midterm Exam	p 450 - 454		Mar. 27	Mar. 17
		p = 47 (2.19) - 48(2.19.3.4)			
0	Dugliastica	p 52 (2.53)-56(2.40.2.5.2)	W/a als Q man dim a manifest		Man 24
9	Duplication	p 433- 470	Critical reading next 1	Spring Decore	Mar. 24
			Critical reading part 1	Mar 30 Apr 8	
				Mar. 30 - Apr. 8	Spring Dagage
				Api. 10	Mar 30 Apr 8
10	Design Transfer & Waying	p 43(2 12) - 47(2 18 2 3)	Week 9 reading review	Apr 17	Apr. 14
10	Design fransier & waxing	p = -7(2.10, 2.13) n 88 (section 21)	Critical reading part 2	Api. 17	Арі. 14
11	Waxing cont	p 470 - 474	Week 10 reading review	Apr 24	Apr 21
	thaning cont		Critical reading part 3	71p1. 21	ripi. 21
12	Spruing and Investing	p 474- 477	Week 11 reading rev.	May 1	Apr. 28
	~ r g and	F · · · · · · ·	Final Critical reading paper		r - •
13	Burnout and Casting		Week 12 reading review	May 8	May 5
_	6		6	· J -	J -
14	Divesting & Review		Review Questions for final	May 15	May 12
			exam		-
15	Final Exam			May 22	May 19

Laboratory	Course	Outline	(Tentative	Schedule	subject to	change)
Laboratory	Course	Outime	(I Childlive	schedule,	subject to	change)

		W Section	S Section
		D325	
1	Infection Control	Jan. 31	Jan. 27
	Pouring Models		
	Record base and Occlusal Rims		
2	Surveying, Path of Insertion Maxillary Cast	Feb. 7	Feb. 3
	Marking undercuts		
	(Project 1&2 due for completion)		
3	Surveying, Design transfer	Feb. 14	Feb. 10
	Block out undercuts		
	(Project 3&4 due for completion)		
4	Relief pad and finish line placement, ledging of desirable undercuts	Feb. 21	Feb. 17
	Duplication of Maxillary master cast		
	Survey and Design Mandibular Diagnostic cast		
	(Project 5 due for completion)		
5	Surveying and Design mandibular cast	Feb. 28	Feb. 24
	Dehydrating and wax dip of Maxillary refractory model		
	Surveying, design transfer mandibular cast		
6	Block out mandibular cast	Mar. 7	Mar. 3
	Duplication of Mandibular Cast		
	Design Transfer to maxillary refractory model.		
	(Project 6&7 due for completion)		
7	Dehydration and wax dip of mandibular refractory model. Wax up,	Mar. 14	Mar 10
	Maxillary refractory edentulous areas. Maxillary Major connector		
	(Project 8 due for completion)		
8	Wax-up, Maxillary plating, rests and clasps. Spruing, maxillary wax-up.	Mar. 21	Mar. 17
	(Project 9 due for completion)		
9	Transfer design to mandibular refractory model. Wax up mandibular	Mar. 28	Mar. 24
	major connector (Project 10&11 due for completion)		
	Spring Recess	Mar. 30 - Apr. 8	
10	Wax-up mandibular minor connectors rest and clasps	Apr. 18	Apr. 14
	Sprue mandibular wax-up. Invest wax-ups		
	(Project 11 due for completion)		
11	Invest wax ups. Casting	Apr 25	Apr. 21
	Wax-up Second maxillary model		
12	Invest wax ups. Casting	May 2	Apr. 28
	Wax-up Second maxillary model		
	Wax-up Second mandibular model		
13	Invest wax ups. Casting	May 9	May 5
	Wax-up Second mandibular model		
	(Project 12&13 due for completion)		
14	Wax up second maxillary and mandibular	May 16	May 12
	Articulation and Tooth Arrangement		
	(Project 14, 15 due for completion)		
15	Equipment maintenance, Uniform Clean-up	May 23	May 19

Revised January, 2018, Anthony Sena, CDT

OUTCOMES ASSESSMENT:

2% 2% 2% 3% 4% 3% 4% 3% 3% reports to health, Sa	Project 10 Project 11 Project 12 Project 13 Project 14 Project 15	4% 4% 3% 4% 4% 3%
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- А = 93-100% A-90-92.9% = B+ = 87-89.9% В = 83-86.9% B-= 80-82.9% C+ 77-79.9% = 70-76.9% С = D = 60-69.9%
- F = 59.9 and below

GRADING CRITERIA FOR REMOVABLE PARTIAL DENTURES LABORATORY SESSION

Project 1:

Infection control procedures

- Hands on receiving and infection control procedures will be accomplished Students will wear appropriate PPE while performing procedures Disinfectant contact time will be observed Inventory and checking-in of cases will be accomplished
- Packaging and labeling of shipping items will be accomplished

Project 2:

Pouring casts: Correct water powder ratio utilized and measurements recorded in Lab Report

- Stone mixed with vacuum mixer
- Model poured free of negative bubbles in critical design areas

Model separated from impression mold after final set with no damage to model.

- Model trimmed without damaging anatomical areas
- Sides of model should be at 90 degree angle to base
- Base trimmed flat parallel to occlusal surface

Base 15mm thick(+/- 1mm) max measured at thinnest point of palate; man measured at thinnest point of tongue space after trimming

Models marked with student name on both heel and base after trimming

Project 3:

Record base and occlusal rims: record base designed to avoid locking into existing teeth.

Undercuts within design area blocked-out

Record base no thicker than 2mm, thinned over crest of ridge to facilitate placement of denture teeth.

- Record base trimmed to follow design and surface smooth and neat.
- Occlusal rim height should be 10mm above the crest of the ridge

Occlusal rim width should be 10mm wide centered over crest of the ridge

Occlusal rim wax should be dense smooth and neat.

Project Due Date: 10 points have been assigned for completing project on time. Completion of project Three is due at the end of the sixth laboratory session

Total points for project 3: 100 pts

Project 4:

Use of surveyor to locate path of insertion: Accurately transfer tripod marks from diagnostic model, (red cross blue circle)

Locate proper tilt on the surveyor utilizing tripod marks. Lock tilt table in position

- Mark undercuts: using the surveyor with carbon marker identify and mark all teeth and soft tissue undercuts.
- Identify and mark desirable undercuts: desirable undercuts will be identified utilizing a surveyor and undercut gauge and marked in red to the desired depth

A vertical red line will be used to identify the terminal edge of the desirable undercut

Design transfer of maxillary design: Major connector design accurately transferred from diagnostic model.

Plating designed with no interference with opposing cast. Anterior plating is scalloped and covers the gingival 1/3 of tooth. Posterior plating covers the gingival 2/3 of tooth Denture base retention drawn 1.5mm from abutment tooth. Retention grids positioned between interproximals of teeth to minimize interference with positioning denture teeth External finish line drawn in blue, position follows diagnostic design allowing room to set teeth Acrylic base outline drawn in blue

Clasp outline drawn, uniform taper from shoulder to tip, clasp follows survey line, clasp tip rounded and bottom edge of retentive clasp on red line of desirable undercut. Approach arm of bar clasp should cross gingival margin at a 90 degree angle. Rest outlines drawn in brown (rests are not colored in red on master model)

Minor connectors connect all components together

Color Coded design followed, metal outline in brown, acrylic outline in blue, tripod red cross blue circle, retentive tip marked in red.

- Overall neatness of design will be assessed care should be made to keep design neat and clear (note check maxillary matrices made in project one to ensure that they are trimmed as to not interfere with the design of the framework. Matrices should not go below survey lines)
- Project Due Date: 10 points have been assigned for completing project on time. Completion of project five is due at the end of the eighth laboratory session

Total points for project 4: 100 pts

Project 5:

Prepare maxillary master model for duplication: design sealed prior to block-out procedures.

Block out master casts: bulk block-out outside design area with baseplate wax eliminating all undercuts outside the design with a neat and smooth appearance

Block-out wax used within design area

Tooling of block-out wax neat and smooth eliminating all undercuts

Excess wax above and below the survey line removed

Undercuts in rugae area blocked out

Place relief wax: adapted to master model with no space under wax

Borders trimmed to internal finish line 1mm from external finish line

1.5mm from abutment teeth

Edge of relief wax sealed with block-out wax and trimmed at 90 degree angle to the model forming an internal finish line that will be 1mm thick.

Tissue stop cut out over the crest of the ridge 2mm X 2mm square sealed with block-out wax.

Ledge desirable undercuts: desirable undercut is exposed down to red undercut design ledge is cut perpendicular to the tooth surface.

- Overall neatness of block-out will be assessed care should be made to keep block-out neat and smooth with removal of excess was
- Project Due Date: 10 points have been assigned for completing project on time. Completion of project six is due at the end of the tenth laboratory session

Total points for project 5: 100 pts

Project 6:

Production of 1st maxillary refractory model,

Duplication: Duplication procedures should be adhered to closely (procedure timeline and

measurements should be recorded in laboratory report observations)

Cast soaked overnight in SDS

Cast soaked 30 minutes in warm 100 degree SDS prior to duplication.

Student name marked on duplicating flask with china marker

Excess water blown off cast prior to placing in duplication flask.

Relief pad checked to ensure that it has not lifted of model.

Position model in flask with at least 12mm clearance on all sides.

Cast secured on base of flask with block-out clay

Flask filled with hydrocolloid (vent hole covered after material reach them)

Bench set for 10 minutes remove any excess material prior to placement in cooling bath.

Water level in cooling bath does not go above base of flask

30 minutes in cooling bath removal time marked with china marker on flask

Investment material and liquid must be prepared prior to removal time from cooling bath to

ensure prompt pouring of refractory model. Investment weight should be recorded in laboratory report as well as the measurement of liquid. The type of material used should also be identified in lab report.

Master model should be removed from the hydrocolloid without distorting or tearing of duplication material.

Position sprue former 7-8 mm away from major connector, sprue former should not distort hydrocolloid

Investment should be thoroughly mixed with vacuum mixer for 30 seconds

Investment should be poured filling the abutment teeth without flowing material from one side of model to the other. Mold must be filled quickly using vibrator to aid in the flow of material due to short working time of investment material.

Investment should not contact sides of flask upon completion of pouring mold.

Refractory model removed from hydrocolloid material after final set but before 50 minutes after pouring model.

Hydrocolloid material is peeled away from the refractory model.

Recovered hydrocolloid shall be cleaned free of investment material and returned to sealed hydrocolloid container.

Flasks shall be cleaned and made ready for next use.

Surface of cast should be inspected for any distortion, no negative bubbles should be within design area, positive bubbles should be removed from non-critical areas, positive bubbles in critical areas may cause inaccurate fit of final restoration.

Sprue hole should be smoothed.

Trimming refractory model: outline model to trim 6mm from design by checking against master cast design outline should be drawn with wax pencil.

Refractory model should be trimmed at 45-60 degree angle on sides and front and at 90 degree angle to occlusion at the heel.

Slurry rinsed of model with SDS

Students name written on heel of model after trimming with sharpie marker.

- Dehydrating: Dehydrate refractory model at proper temperature and time and procedures for refractory material and sealant used.
- Overall results of Project: The refractory model is a critical step in the fabrication process adherence to procedures is paramount to success of each person in the class. Grading for project will be based on observed performance of following the given verbal, written and demonstrated instructional steps. Lab report observations will be used in grading for this project. Refractory model will be evaluated for accuracy and adherence to verbal and written instructions and demonstrations.
- Project Due Date: 10 points have been assigned for completing project on time. Completion of project seven is due at the end of the thirteenth laboratory session

Total points for project 6: 100 pts

Project 7:

- Survey and design of mandibular diagnostic model: Each student will design their own mandibular framework design based on case and knowledge of design principles acquired from lecture and reading assignments.
- Functional design made on diagnostic model. Approved by instructor
- Use of surveyor to locate path of insertion: Accurately transfer tripod marks from diagnostic model, red cross blue circle

Locate proper tilt on the surveyor utilizing tripod marks. Lock tilt table in position

- Mark undercuts: using the surveyor with carbon marker identify and mark all teeth and soft tissue undercuts.
- Identify and mark desirable undercuts: desirable undercuts will be identified utilizing a surveyor and undercut gauge and marked in red to the desired depth

A vertical red line will be used to identify the terminal edge of the desirable undercut

Design transfer of mandibular design: Major connector design accurately transferred from diagnostic model. If mandibular lingual bar is used top edge designed 4mm below top of free gingival bottom edge of major connector should not impinge on lingual frenum. Plating designed with no interference with opposing cast. Anterior plating is scalloped and

covers the gingival 1/3 of tooth. Posterior plating covers the gingival 2/3 of tooth Denture base retention drawn 1.5mm from abutment tooth. Retiention grids positioned to minimize interference with positioning denture teeth

External finish line drawn in blue, position allows room to set teeth, distal extension finish line forms fishtail on major connector.

Acrylic base outline drawn in blue

Clasp outline drawn, uniform taper from shoulder to tip, clasp follows survey line, clasp tip rounded and bottom edge of retentive clasp on red line of desirable undercut. Rest outlines drawn in brown(rests are not colored in red on master model)

Minor connectors connect all components together

Color Coded design followed, metal outline in brown, acrylic outline in blue, tripod red-cross blue circle retentive tip marked in red.

- Overall neatness of design will be assessed care should be made to keep design neat and clear (note check mandibular matrices made in project one to ensure that they are trimmed as to not interfere with the design of the framework. Matrices should not go below survey lines)
- Project Due Date: 10 points have been assigned for completing project on time. Completion of project eight is due at the end of the fourteenth laboratory session

Total points for project 7: 100 pts

Project 8:

Prepare mandibular master model for duplication: design sealed prior to block-out procedures.

Block out master casts: bulk block-out outside design area with baseplate wax eliminating all undercuts outside the design with a neat and smooth appearance

Thin flash of wax placed over lower half of the major connector

Block-out wax used within design area

Tooling of block-out wax neat and smooth eliminating all undercuts

Excess wax above and below the survey line removed

Place relief wax: adapted to master model with no space under wax

Borders trimmed to internal finish line 1mm from external finish line

1.5mm from abutment teeth

Edge of relief wax sealed with block-out wax and trimmed at 90 degree angle to the model forming an internal finish line that will be 1mm thick.

Tissue stop cut out over the crest of the ridge of distal extension 2mm X 2mm square sealed with block-out wax.

- Ledge desirable undercuts: desirable undercut is exposed down to red undercut design ledge is cut perpendicular to the tooth surface.
- Overall neatness of block-out will be assessed care should be made to keep block-out neat and smooth with removal of excess wax
- Project Due Date: 10 points have been assigned for completing project on time. Completion of project nine is due at the end of the sixteenth laboratory session

Total points for project 8: 100 pts

Project 9:

Production of 1st mandibular refractory model,Duplication:Duplication procedures should be adhered to closely (procedure timeline and

measurements should be recorded in laboratory report observations)

- Criteria for project 7, duplication, trimming, dehydrating and sealing of refractory model is the same as project 4 duplication of 1st maxillary refractory model.
- Overall results of Project: The refractory model is a critical step in the fabrication process adherence to procedures is paramount to success of each person in the class. Grading for project will be based on observed performance of following the given verbal, written and demonstrated instructional steps. Lab report observations will be used in grading for this project. Refractory model will be evaluated for accuracy and adherence to verbal and written instructions and demonstrations.
- Project Due Date: 10 points have been assigned for completing project on time. Completion of project ten is due at the end of the eighteenth laboratory session

Total points for project 9 100 pts

Project 10:

Design transfer to 1st maxillary refractory model, wax-up of maxillary framework

- Design from master model accurately transferred to sealed refractory model.
 - Metal design transferred using brown pencil. Model should not be scratched by pencil. Clasp tips should be drawn into ledge with bottom edge of clasp resting on ledge.
- Maxillary preparatory wax-up: beadline filled even with tissue surface. Wax flown on crest of rugae. Internal finish line filled in with wax to make smooth transition onto relief area. Tissue stop filled even with relief area. 24 gauge sheet casting wax adapted onto relief area 1mm beyond internal finish line and blended into ramp of internal finish line.
- Maxillary denture base retention applied: Design of outer border followed using 12 gauge 1/2 round wax with flat side down, maintaining thickness of wax. 12 ga.1/2rd for cross struts. Wax flared at areas of attachment with no thin spots. Tissue stop connected to outer border sealed with wax.
- Maxillary finish line applied: 18 gauge round wax used to create finish line positioned 1.0 to 1.5mm lingual to internal finish line. Finish line should extend up distal lingual side of distal plating on abutment tooth. Lingual side of finish line should blend smoothly into ramp from palate.
- Tube tooth waxed up: Matrix for tube tooth checked on refractory model for accuracy. Tube tooth sticky waxed to matrix. Separator applied to tube tooth preparation. Post preparation filled with wax with no voids. Post sealed to ridge of refractory model. Space under tube tooth filled with wax void free. Occlusion checked. Lingual contours properly waxed neat and smooth following lingual contours of tube tooth. Buccal collar trimmed to buccal contours of tube tooth. Remove any excess wax that covers the buccal surface of the tooth.
- Metal Backing for lateral facing waxed: Centric occlusion checked. Proper lingual contours followed mirroring contours of other lateral. Incisal edge in line with curvature of abutment teeth. Incisal height and length of ridge lap matches other lateral. Lingual anatomy smooth. Labial hollowed out wax thickness between 0.5 and 1.0mm
- Maxillary lingual plating waxed: lingual plating follows contour of teeth maintaining an even thickness between 0.5 and 1.0 mm. Borders of plating should be sealed to refractory model following plating design. Plating should be neat and smooth and blend smoothly into the major connector.
- Maxillary major connector adapted: stippled surface face up connected smoothly to bottom edge of plating. Stipple sheet extends slightly beyond beadline to ensure complete casting of beadline. Stipple sheet forms outer edge of external finish line. Stipple sheet should be adapted so that no air bubbles are trapped under pattern. Stipple pattern should be distortion free and not thinned out due to excess pressure. Boarders of major connector should be completely sealed to refractory model. Refractory model should not be scratched while trimming pattern.
- Maxillary minor connectors and rests waxed: Rests should be waxed to completely fill design with a thickness between 1.0 and 1.5mm. minor connectors should be approximately 1.0 mm think following design.
- Clasps applied: Tacky liquid applied to clasp. Clasp tip positioned on ledge. Clasp should be curved up towards the rest. Shoulder of clasp same height as top edge of rest preparation and blend into rest.

Approach arm of bar clasp should follow proper design crossing gingival border at 90 degree angle. Borders of clasp neat no excess wax or tacky liquid. Clasps follow original design. Clasps adapted well to refractory model. Clasps maintain proper taper without distortions. All clasp components connected smoothly and neatly to the rest of the waxed framework without thinning out at connection areas.

Project Due Date: 10 points have been assigned for completing project on time. Completion of project eleven is due at the end of the twentieth laboratory session

Total points for project 10: 100 pts

Project 11:

- Design transfer to 1st mandibular refractory model, wax-up of mandibular framework
- Design from master model accurately transferred to sealed refractory model.
 - Metal design transferred using brown pencil. Model should not be scratched by pencil. Clasp tips should be drawn into ledge with bottom edge of clasp resting on ledge.
- Mandibular preparatory wax-up: Internal finish line filled in with wax to make smooth transition onto relief area. Tissue stop filled even with relief area. Wax flashed over major connector design area
- Mandibular major connector adapted: Pattern adapted firmly to refractory model following bottom edge of design. Top and bottom edge of pattern shall be sealed to refractory model with inlay wax. Fishtail of finish line positioned at distal corner of last abutment tooth. Pattern end that design ends in metal should be cut at 45 degree angle.
- Denture base retention applied: Using either mesh or bar retention. If bar retention is used design of outer border using 12 gauge 1/2 round wax with flat side down, maintaining thickness of wax. 12 ga.1/2rd for cross struts. Wax flared at areas of attachment with no thin spots. Tissue stop connected to outer border sealed with wax. Ensure all patterns are firmly adapted to the refractory model.
- Finish line applied: 18 gauge round wax used to create finish line positioned 1.0 to 1.5mm lingual to internal finish line. Finish line should extend up lingual side of plating on abutment tooth. Lingual side of finish line should blend smoothly into major connector.
- Lingual plating waxed: lingual plating follows contour of teeth maintaining an even thickness between 0.5 and 1.0 mm. Borders of plating should be sealed to refractory model following plating design. Plating should be neat and smooth and blend smoothly into the major connector.
- Minor connectors and rests waxed: Rests should be waxed to completely fill design with a thickness between 1.0 and 1.5mm. minor connectors should be approximately 1.0 mm think following design.
- Clasps applied: Tacky liquid applied to clasp. Clasp tip positioned on ledge. Clasp should be curved up towards the rest. Shoulder of clasp same height as top edge of rest preparation and blend into rest. Approach arm of any bar clasp should follow proper design crossing gingival border at 90 degree angle. Borders of clasp neat no excess wax or tacky liquid. Clasps follow original design. Clasps adapted well to refractory model. Clasps maintain proper taper without distortions. All clasp components connected smoothly and neatly to the rest of the waxed framework without thinning out at connection areas.

Project Due Date: 10 points have been assigned for completing project on time. Completion of project twelve is due at the end of the twenty second laboratory session

Total points for project 11: 100 pts

Project 12: (Spruing, investing, burnout and casting of maxillary and mandibular frameworks)Maxillary sprue lead attached: 6 gauge round wax sealed to refractory. Thin and fanned at point of

attachment with major connector. Sprue lead thickest at attachment to sprue base. No irregularity in wax sprue lead

- Mandibular sprue lead attached: 6 gauge round wax sealed to refractory. Thin and fanned at point of attachment with major connector. Sprue lead thickest at attachment to sprue base. No irregularity in wax sprue lead.
- Max waxup invested: Pattern sprayed with debubblizer. Investment ring and base coated with Vaseline. Investment ring correctly positioned on base. Correct liquid to powder ratio used. Investment mixed according to manufacturer's directions. Investment ring filled quickly without trapping air bubbles. Equipment and work area cleaned up after investing. Mold removed from ring after reaching final set. Mold labeled with students name.
- Man waxup invested: Pattern sprayed with debubblizer. Investment ring and base coated with Vaseline. Investment ring correctly positioned on base. Correct liquid to powder ratio used. Investment mixed according to manufacturer's directions. Investment ring filled quickly without trapping air bubbles. Equipment and work area cleaned up after investing. Mold removed from ring after reaching final set.. Mold labeled with students name
- Molds placed in burnout oven: Sprue hole down. Molds not contacting each other or oven walls
- Casting procedures: Check water pressure. Position crucible. Place metal in crucible. Select casting setting. Preheat metal. Place mold in casting machine. Close casting machine doors. Melt metal. Monitor metal casting. Prepared for next casting. Removed oxide shell of metal from crucible. Allowed mold to bench cool (30min)
- Project Due Date: 10 points have been assigned for completing project on time. Completion of project thirteen is due at the end of the twenty sixth laboratory session

Total points for project 12: 100 pts

Project 13:

Criteria for project 13 design transfer to 2^{nd} maxillary refractory model, wax-up of maxillary framework is the same as project 10

Project Due Date: 10 points have been assigned for completing project on time. Completion of project fourteen is due at the end of the twenty seventh laboratory session

Total points for project 13: 100 pts

Project 14:

Criteria for project 14 design transfer to 2nd mandibular refractory model, wax-up of mandibular framework is the same as project 11

Project Due Date: 10 points have been assigned for completing project on time. Completion of project fifteen is due at the end of the twenty eighth laboratory session

Total points for project 14: 100 pts

Project 15: (If time Permits)

Diagnostic set-up of denture teeth: Max/ Man casts articulated in Maximum Intercuspation M.I

Mounting neat and smooth Denture teeth spaced ½ mm from abutment teeth Teeth aligned over crest of the ridge Marginal ridge heights properly aligned with adjacent teeth Buccal length of tooth maintained Occlusal alignment incorporates proper Curve of Spee and Curve of Wilson All Maxillary and Mandibular teeth maintain good centric contact

Excursive interferences eliminated

Stone matrices constructed to incorporate denture teeth and at least two abutment teeth.

Matrices should not cover buccal or lingual surfaces of abutment teeth

Preparation of tube tooth: ¹/₂ mm preparation into denture tooth from mesial around lingual to distal of tooth.

Mesial and distal preparation should be parallel to each other

Post hole prepared in center of the tooth about 2mm in diameter parallel to mesial distal and lingual preparations

Slight bevel prepared at base of tooth

Project Due Date: 10 points have been assigned for completing project on time. Completion of project four is due at the end of the sixth laboratory session

Total points for project 15: 100 pts

Students must achieve a minimum passing grade of at least 70% in theory as well as laboratoryNEW YORK CITY COLLEGE OF TECHNOLOGYDEPARTMENT OFTHE CITY UNIVERSITY OF NEW YORKRESTORATIVE DENTISTRY

RESD 1216 REMOVABLE PARTIAL DENTURES I

<u>COURSE OUTLINE</u> RESD 1216 - REMOVABLE PARTIAL DENTURES

Sessions

- 1. I. Course Overview (General)
 - 1. Attendance policy
 - 2. Seating Assignments
 - 3. Dress
 - 4. Safety and health
 - 5. Review of course outline
 - 6. Clean-up procedures
 - II. Clinical and laboratory procedures for producing an R.P.D. including infection control procedures.
 - III. Pouring of impressions
 - IV. Record base and occlusal rims
- 2. I. Discussion: Drawing R.P.D. designs (Maxillary) References. p. 391 - 437 Air Force Manual
 - 1. Colors (p 436-437)
 - a. red = rests (diagnostic)
 - b. brown = framework
 - c. blue = acrylic
 - 2. Parts (p437-439)
 - a. rests
 - b. clasps
 - c. major connectors
 - d. minor connectors
 - e. retention grid

- II. Surveying (Maxillary Master Cast)
 - 1. Finding Path of insertion
 - 2. Transfer Tripod marks
 - 3. Finding tilt using tripod marks
- III. Locating undercuts
- IV. Survey lines
 - 1. undercut areas
 - 2. non undercut areas
- V. Locate .010 undercuts for clasp tips
- **3.** I. Drawing R.P.D. designs (maxillary)
 - II. Discussion of "Bead line" maxillary cast
 - III. Transfer design from preliminary cast to master casts (note: Do not transfer clasp design from diagnostic model)
 - VI. Draw clasp design (following survey lines and desirable undercuts)
 - VII. Seal design
 - VIII. Block-out undercuts
 - 1. bulk block-out outside design with baseplate wax
 - 2. block-out within design area with block-out wax

4. I. Apply relief wax

- 1. adapt 24 gauge pressure sensitive sheet casting wax
- 2. apply block-out wax for finish line
- 3. produce tissue stops
- II. Ledge desirable undercuts
- III. Adapt sprue cone
- IV. Prepare Maxillary master cast for duplication
 - 1. Soak cast for twenty (20) minutes
 - 2. Ensure relief pads are still adapted to model
- IV. Duplicate Maxillary master cast with agar hydrocolloid
 - 1. Place sprue former
 - 2. Pour refractory cast
 - 3. Separate refractory from hydrocolloid
 - 4. Clean hydrocolloid material for reuse

- V. Survey and Design mandibular diagnostic cast
- 5. I. Survey and Design mandibular master cast
 - 1. Find path of Insertion
 - 2. Mark survey lines
 - 3. Mark 0.010" undercuts for clasp tips
 - 4. Transfer design
 - 5. Seal design
 - II. Trim Maxillary refractory model
 - III. Dehydrate refractory model
 - IV. Apply cast sealer
- 6. I. Block out mandibular cast
 - 1. bulk block-out outside design area with baseplate wax
 - 2. block-out within design area with block-out wax
 - II. Adapt relief wax if needed
 - 1. create finish lines
 - 2. produce tissue stops
 - III. Ledge desirable undercuts
 - V. Adapt sprue cone
 - VI. Prepare Mandibular master cast for duplication
 - 1. Soak cast for twenty (20) minutes
 - 2. Ensure relief pads are still adapted to model
 - VII. Duplicate Mandibular master cast with agar hydrocolloid
 - 1. Place sprue former
 - 2. Pour refractory cast
 - 3. Separate refractory from hydrocolloid
 - 4. Clean hydrocolloid material for reuse
 - VIII. Transfer design from maxillary master cast to refractory cast
 - IX. Turn-in refractory cast for grading
- 7. I. Trim Mandibular refractory model
 - II. Dehydrate refractory cast
 - III. Apply cast sealer
 - IV. Wax-up Maxillary

- 1. Fill bead-lines
- 2. Prepare major connector area
- 3. Fill internal finish lines and tissue stops
- 4. Wax-up edentulous areas
- 5. Wax external finish line
- 6. Wax major connector
- 8. I. Wax-up Maxillary Continued
 - 1. Wax plating
 - 2. Wax rests
 - 3. Wax clasps
 - 4. Sprue wax-up
- 9. I. Transfer design to Mandibular refractory model
 - II. Wax-up mandibular
 - 1. Internal finish lines
 - 2. Tissue stops
 - 3. Major connector
 - 4. Retention grids

10. I. Mandibular wax-up continued

- 1. Minor connectors
- 2. Rests
- 3. Clasps
- II. Sprue mandibular wax-up
- III. Invest wax-up
- **11.** I. Invest wax-up (cont.)
 - II. Burnout and casting of maxillary and mandibular frameworks
 - III. Wax-up second maxillary cast
- **12.** I. Invest wax-up (cont.)
 - II. Burnout and casting of maxillary and mandibular frameworks (cont.)
 - III. Wax-up second maxillary cast (cont.)
 - IV. Wax-up of second mandibular framework
- **13.** I. Invest wax-up (cont.)
 - II. Burnout and casting of maxillary and mandibular frameworks (cont.)

- III. Complete second wax-up of maxillary and mandibular framework
- 3. I. How to articulate R.P.D.'s a. hand articulations b. use of a wax-bite when articulating
 - c. galeti articulator
 - d. hinge articulator
 - e. Hanau articulator
- II. Procedures for articulating an R.P.D. case
 - III. Tooth arrangement for edentulous areas
- 30. Clean-up

OUTCOMES ASSESSMENT RESD 1216 REMOVABLE PARTIAL DENTURES I PRACTICAL LABORATORY PROJECTS

REMOVABLE PARTIAL DENTURES PROJECT NUMBER ONE (PRACTICAL LABORATORY)

- I. Instructions:
 - A. Inventory material to be used in lab project
 - B. Wash hands
 - C. Don PPE
 - D. Disinfect surfaces and case pans
 - E. Open cases and disinfect contents
 - F. Inventory and login cases
 - G. Pack and label items for shipping

II. Grading

A. Instructor observation of compliance with infection control procedures

TOTAL = 100 POINTS

PROJECT NUMBER TWO (PRACTICAL LABORATORY)

- I. Instructions:
 - A. Pour models of a maxillary Class II and a mandibular Class II
 - B. Articulate maxillary and mandibular casts
 - C. Arrange denture teeth in edentulous spaces
 - D. Make stone matrix of occlusals of teeth
 - E. Pour model of a maxillary Class I
 - F. Make record base and occlusal rim for Class I model

G. Prepare tube tooth

II. Grading

A. Maxillary cast

- 1. Proper mixing and pouring technique (2.5pts)
- 2. Cast surface dense and free of voids (2.5pts)
- 3. Base trimmed to proper thickness (2.5pts)
- 4. Student name marked on side and bottom of cast (2.5pts)

B. Mandibular cast

- 1. Proper mixing and pouring technique (2.5 pts)
- 2. Cast surface dense and free of voids (2.5pts)
- 3. Base trimmed to proper thickness (2.5pts)
- 4. Student name marked on side and bottom of cast (2.5pts)

C. Articulation

- 1. Maxillary and mandibular casts Articulated correctly (2.5 pts)
- 2. Mounting neat and smooth (2.5pts)

D. Denture teeth

- 1. Positioned correctly (24pts)
- 2. Stone matrix (6pts)
- 3. Tube tooth prepared correctly (10pts)
- E. Record base and occlusals rim
 - 1. Undercuts blocked out (2.5pts)
 - 2. Record base follows correct design (2.5pts)
 - 3. Record base has proper thickness (5pts)
 - 4. Record base smooth and neat (5pts)
 - 5. Occlusal rim proper height and width (5pts)
 - 6. Occlusal Rim correctly centered (2.5pts)
 - 7. Occlusal Rim dense, smooth and neat (2.5pts)
- F. Project completed by due date (10pts)

TOTAL = 100 POINTS

REMOVABLE PARTIAL DENTURES PROJECT NUMBER TWO (PRACTICAL LABORATORY)

I. Instructions:

- A. Transfer Tripod marks from preliminary cast to master cast
- B. Find path of insertion using surveyor
- C. Mark survey lines with carbon marker
- D. Transfer design from preliminary cast to master cast
- E. Locate and mark desirable undercuts

F. Draw design for clasp assembly

II. Grading

A. Maxillary cast

- 1. Tripod Marks accurately transferred (10 pts)
- 2. Proper tilt located on survey table (10pts)
- 3. Survey lines properly marked (10pts)
- 4. Major Connector Transferred neatly and accurately (5pts)
- 5. Plating (5pts)
- 7. Acrylic retention (5pts)
- 8. Internal finish line (5pts)
- 9. Denture base outline (5pts)
- 9. Clasps and rests (20 pts)
- 10. Minor connectors (5pts)
- 11. Color coded design followed (5pts)
- 11. Overall neatness (5pts)
- 12. Project completed by due date (10pts)

TOTAL = 100 POINTS

REMOVABLE PARTIAL DENTURES PROJECT NUMBER THREE (PRACTICAL LABORATORY)

I. Instructions:

- A. Seal design with design sealer
- B. Block-out, outside design area with baseplate wax
- C. Block-out within design areas with block-out wax
- D. Place relief wax on master cast
- E. Ledge desirable undercuts

II. Grading

- A. Maxillary cast
 - 1. Design sealed (5pts)
 - 2. Bulk block-out (10pts)
 - 3. Block-out with-in design area (40pts)
 - 4. Relief wax placed correctly (10 pts)
 - 5. Tissue stop (10pts)
 - 6. Ledge desirable undercuts (10pts)
 - 7. Overall Neatness (5pts)
 - 8. Project completed by due date (10pts)

TOTAL = 100 POINTS

REMOVABLE PARTIAL DENTURES PROJECT NUMBER FOUR (PRACTICAL LABORATORY)

I. Instructions:

- A. Soak maxillary master cast with SDS prior to duplication
- B. Prepare cast in duplicating flask
- C. Fill duplicating flask with hydrocolloid material
- D. Follow cooling procedures
- E. Prepare investment prior to pouring time
- F. Remove cast from duplicating material and place sprue former
- G. Pour refractory model
- H. Recover refractory model
- I. Clean duplicating material and flasks
- J. Trim refractory model
- K. Dehydrate refractory model
- L. Seal refractory model

II. Grading

- A. Maxillary cast
 - 1. Casts soaked
 - a. Casts placed in 6 mm deep SDS, soaked overnight (1pt)
 - b. Hygrobath warmed to 90° (+/- 2°) for 30 minutes (1pt)
 - 2. Maxillary/Mandibular casts removed from water bath
 - a. Excess water blown off cast (1pt)
 - b. Relief pads still in correct position (4pts)

3. Maxillary/Mandibular casts centered in flasks

- a. Student's name marked on flask with china marker (2pts)
- b. At least 12mm clearance from casts to sides of flask (2pts)
- c. Casts secured with block-out clay (2pts)
- 4. Maxillary/Mandibular flasks filled with hydrocolloid
 - a. Flask filled until hydrocolloid reaches vent holes (2pts)
 - b. Flask bench cooled for 10 minutes (2pts)
 - c. Excess hydrocolloid removed prior to placement in cool water bath (4pts)
- 5. Maxillary/Mandibular flasks cooled
 - a. Water level in tray not above base of flask (2pts)
 - b. Removal time marked on flask (30 min cooling time) (4pts)
- 6. Investment material prepared
 - a. Investment material accurately measured and measurement recorded (5pts)
 - b. Amount of water and special liquid accurately measured and measurement recorded (5pts)
- 7. Maxillary/Mandibular flasks warmed after cooling cycle (10min) (2pts)
- 8. Maxillary/Mandibular casts removed from the hydrocolloid
 - a. Cast removed from hydrocolloid without distortion or tearing of material (5pts)
 - b. Sprue former positioned. centered 7-8mm away from major connector (5pts)

9. Maxillary/Mandibular refractory casts poured

- a. Investment properly mixed (2pts)
- b. Investment spot filled into mold, not flowed around mold (2pts)
- c. Investment not touching flask (2pts)
- d. Hydrocolloid removed from flask cleaned and returned to

sealed container (2pts)

10. Maxillary/Mandibular refractory cast recovered

- a. Surface of cast not distorted (2pts)
- b. No negative bubbles within design of partial (2pts)
- c. Positive bubbles removed (2pts)
- d. Sprue holes smoothed (2pts)

11. Hydrocolloid recovered

- a. Rinsed under water to remove investment (5pts)
- b. Stored in sealed container (2pts)
- c. Flask cleaned and ready for next use (2pts)

12. Maxillary/Mandibular refractory casts trimmed

- a. Line drawn 6 mm from outer limits of design with a wax pencil (2pts)
- b. Cast trimmed at 45 degree angle to line mentioned above, except for heel area which is 90 degrees (2pts)
- c. Slurry rinsed off cast with SDS (2pts)

13. Casts dehydrated

- a. Minimum 30 minutes (2pts)
- b. Temp 180°F to 200°F (2pts)

14. Casts wax-dipped

- a. Wax temperature 280° 300°F (2pts)
- b. Excess wax blown off (2pts)
- c. Refractory casts placed on absorbent paper to cool (2pts)
- 15. **Time constraints met** (10pts)

TOTAL = 100 POINTS

REMOVABLE PARTIAL DENTURES PROJECT NUMBER FIVE (PRACTICAL LABORATORY)

I. Instructions:

- A. Survey and design mandibular framework on preliminary model
- B. Transfer Tripod marks from preliminary cast to master cast
- C. Find path of insertion using surveyor
- D. Mark survey lines with carbon marker
- E. Transfer design from preliminary cast to master cast
- F. Locate and mark desirable undercuts
- G. Draw design for clasp assembly

II. Grading

A. Mandibular cast

- 1. Functional design created on preliminary cast (10pts)
- 2. Tripod Marks accurately transferred (5 pts)
- 2. Proper tilt located on survey table (7.5pts)
- 3. Survey lines properly marked (10pts)
- 4. Major Connector Transferred neatly and accurately (5pts)

- 5. Plating (2.5pts)
- 7. Acrylic retention (5pts)
- 8. Internal finish line (5pts)
- 9. Denture base outline (5pts)
- 9. Clasps and rests (20 pts)
- 10. Minor connectors (5pts)
- 11. Color coded design followed (5pts)
- 11. Overall neatness (5pts)
- 12. Project completed by due date (10pts)

TOTAL = 100 POINTS

REMOVABLE PARTIAL DENTURES PROJECT NUMBER SIX (PRACTICAL LABORATORY)

I. Instructions:

- A. Seal design with design sealer
- B. Block-out, outside design area with baseplate wax
- C. Block-out within design areas with block-out wax
- D. Place relief wax on master cast
- E. Ledge desirable undercuts

II. Grading

A. Mandibular cast

- 1. Design sealed (5pts)
- 2. Bulk block-out (10pts)
- 3. Block-out with-in design area (40pts)
- 4. Relief wax placed correctly (10 pts)
- 5. Tissue stop (10pts)
- 6. Ledge desirable undercuts (10pts)
- 7. Overall Neatness (5pts)
- 8. Project completed by due date (10pts)

TOTAL = 100 POINTS

REMOVABLE PARTIAL DENTURES PROJECT NUMBER SEVEN (PRACTICAL LABORATORY)

- I. Instructions:
 - A. Soak cast with SDS prior to duplication
 - B. Prepare cast in duplicating flask
 - C. Fill duplicating flask with hydrocolloid material
 - D. Follow cooling procedures
 - E. Prepare investment prior to pouring time
 - F. Remove cast from duplicating material and place sprue former

- G. Pour refractory model
- H. Recover refractory model
- I. Clean duplicating material and flasks
- J. Trim refractory model
- K. Dehydrate refractory model
- L. Seal refractory model

II. Grading

- A. Mandibular cast
 - 1. Casts soaked
 - a. Casts placed in 6 mm deep SDS, soaked overnight (1pt)
 - b. Hygrobath warmed to 90° (+/- 2°) for 30 minutes (1pt)
 - 2. Maxillary/Mandibular casts removed from water bath
 - a. Excess water blown off cast (1pt)
 - b. Relief pads still in correct position (4pts)

3. Maxillary/Mandibular casts centered in flasks

- a. Student's name marked on flask with china marker (2pts)
- b. At least 12mm clearance from casts to sides of flask (2pts)
- c. Casts secured with block-out clay (2pts)

4. Maxillary/Mandibular flasks filled with hydrocolloid

- d. Flask filled until hydrocolloid reaches vent holes (2pts)
- e. Flask bench cooled for 10 minutes (2pts)
- f. Excess hydrocolloid removed prior to placement in cool water bath (4pts)

5. Maxillary/Mandibular flasks cooled

- a. Water level in tray not above base of flask (2pts)
- b. Removal time marked on flask (30 min cooling time) (4pts)

6. Investment material prepared

- a. Investment material accurately measured and measurement recorded (5pts)
- b. Amount of water and special liquid accurately measured and measurement recorded (5pts)

7. Maxillary/Mandibular flasks warmed after cooling cycle (10min) (2pts)

- 8. Maxillary/Mandibular casts removed from the hydrocolloid
 - a. Cast removed from hydrocolloid without distortion or tearing of material (5pts)
 - b. Sprue former positioned. centered 7-8mm away from major connector (5pts)
- 9. Maxillary/Mandibular refractory casts poured
 - a. Investment properly mixed (2pts)
 - b. Investment spot filled into mold, not flowed around mold (2pts)
 - c. Investment not touching flask (2pts)
 - d. Hydrocolloid removed from flask cleaned and returned to

sealed container (2pts)

10. Maxillary/Mandibular refractory cast recovered

- a. Surface of cast not distorted (2pts)
- b. No negative bubbles within design of partial (2pts)
- c. Positive bubbles removed (2pts)
- d. Sprue holes smoothed (2pts)

11. Hydrocolloid recovered

- a. Rinsed under water to remove investment (5pts)
- b. Stored in sealed container (2pts)

c. Flask cleaned and ready for next use (2pts)

12. Maxillary/Mandibular refractory casts trimmed

- a. Line drawn 6 mm from outer limits of design with a wax pencil (2pts)
- b. Cast trimmed at 45 degree angle to line mentioned above, except for heel area which is 90 degrees (2pts)
- c. Slurry rinsed off cast with SDS (2pts)

13. Casts dehydrated

- a. Minimum 30 minutes (2pts)
- b. Temp 180°F to 200°F (2pts)

14. Casts wax-dipped

- a. Wax temperature 280° 300°F (2pts)
- b. Excess wax blown off (2pts)
- c. Refractory casts placed on absorbent paper to cool (2pts)
- 15. **Time constraints met** (10pts)

TOTAL = 100 POINTS

REMOVABLE PARTIAL DENTURES PROJECT NUMBER EIGHT (PRACTICAL LABORATORY)

- I. Instructions:
 - A. Transfer maxillary design from master cast to refractory model
 - B. Wax refractory model following design using preformed patterns and inlay wax

II. Grading

1. Designs transferred to refractory casts

- a. Original designs followed (4 pts)
- b. Cast not scraped with pencil (3 pt)
- c. Clasps tips drawn into ledges (3 pts)

2. Maxillary preparatory wax-up completed

- a. Beadlines filled even with tissue surface (1 pt)
- b. Wax flowed onto crest of rugae (1 pt)
- c. Wax flowed along relief pad to form a ramp (internal finish line) (1 pt)
- d. Tissue stop filled even with relief pad (1 pt)
- e. 24 gauge sheet casting wax adapted ~ 1mm onto relief pad and blended into ramp of
- internal finish line (1 pt)

3. Maxillary denture base retention applied

- a. Design of outer border followed using 12 gauge 1/2 round wax with flat side down, maintaining thickness of wax (1 pt)
- b. 12 ga.1/2rd for cross struts (1 pt)
- c. Wax flared at areas of attachment with no thin spots (2 pts)
- d. Tissue stop connected to outer border (1 pt)
- 4. Maxillary finish lines applied

- a. Finish line positioned 1.0 to 1.5mm lingual to internal finish lines (2 pts)
- b. 18 gauge round wax used (1 pt)
- c. Blended into rest and open ends sharpened (2 pts)

5. **Tube Tooth waxed-up**

- a. Separator applied (1 pt)
- b. Post preparation filled with wax (no voids) (2 pts)
- c. Post sealed to ridge (1 pt)
- d. No voids in wax under tooth (2 pts)
- e. Centric occlusion checked (1 pt)
- f. Lingual contours adequately waxed (2 pts)
- g. Buccal collar adequately trimmed (1 pt)

6. Metal Backing waxed

- a. Centric occlusion checked (1 pt)
- b. Proper lingual contours followed (2 pts)
- c. Incisal edge in line with curvature of abutment teeth (1 pt)
- d. Incisal height matches other lateral (2 pts)
- e. Length of ridge lap matches length of other lateral (2 pts)
- f. lingual anatomy smooth (1 pt)
- g. Labial hollowed out wax thickness between 0.5 and 1.0mm (1 pt)

7. Maxillary lingual plating outlined

- a. Edges of lingual plating design sealed to refractory model (2 pts)
- b. Approximately 0.5 1 mm thickness (2 pts)

8. Maxillary lingual plating completed

- a. Even thickness of wax filled from top of lingual plating down to major connector (2 pts)
- b. Lingual contours of teeth followed (2 pts)
- c. Inlay wax blended into stipple sheet with no line of demarcation (2 pts)

9. Maxillary major connector adapted

- a. Stippled surface up (1 pt)
- b. Major connector design area covered without going up on linguals of teeth (1 pt)
- c. Stipple sheet extended beyond bead line to allow for finishing (2 pts)
- d. No air trapped under stipple sheet (2 pts)
- e. Cast not scribed by knife (1 pt)
- f. Wax pattern not thinned out or distorted (1 pt)
- g. Entire pattern sealed (2 pts)

10. Maxillary minor connectors/rests waxed

- a. Rest preparation waxed to fill in design(approximate thickness 1 to 1.5 mm) (2 pts)
- b. Minor connector approximately 1 mm thick staying within the boundaries of design and rounded at the connector of bottom edge of clasp (2 pts)
- c. Junction of rest and connector should be 90 degrees to plane of occlusion (1 pt)

11. Maxillary clasps applied

- a. Tacky liquid applied to clasp (2 pts)
- b. Clasp tip positioned on ledge (2 pts)
- c. Clasp curved up towards the rest (2 pts)
- d. Shoulder of clasp same height as top edge of rest preparation or top of minor connector (2 pts)
- e. Approach arm of infrabulge clasp properly positioned (2 pts)
- f. Borders of clasp neat no excess wax or tacky liquid (2 pts)
- g. Clasps follow original design (2 pts)

- h. Clasps adapted well to refractory model (2 pts)
- i. Clasps maintain proper taper without distortions (2 pts)
- j. All clasp components connected to the framework (2 pts)
- 12. Time constraints met (10 pts)

TOTAL = 100 POINTS

REMOVABLE PARTIAL DENTURES PROJECT NUMBER NINE (PRACTICAL LABORATORY)

I. Instructions:

- A. Transfer mandibular design from master cast to refractory model
- B. Wax refractory model following design using preformed patterns and inlay wax

II. Grading

1. **Designs transferred to refractory casts**

- a. Original designs followed (4 pts)
- b. Cast not scraped with pencil (3 pts)
- c. Clasps tips drawn into ledges (3 pts)

2. Mandibular preparatory wax-up completed

- a. Wax flowed along relief pad to form a ramp (internal finish line) (4 pts)
- b. Wax flashed over major connector design area (3 pts)
- c. Tissue stop filled even with relief pad (3 pts)

3. Mandibular major connector adapted to refractory cast

- a. $6 \text{ ga } \frac{1}{2} \text{ pear plastic pattern adapted to bottom edge of design line (2.5 pts)}$
- b. Ends of major connector cut at 45 degree angle (2.5 pts)
- c. Plastic pattern sealed with inlay wax (2.5pts)
- d. Fishtail waxed in next to open retention (2.5 pts)

4. Mandibular lingual plating outlined

- a. Edges of lingual plating design sealed to refractory model (2 pts)
- b. Approximately 0.5 1 mm thickness (2 pts)

5. Mandibular lingual plating completed

- a. Even thickness of wax filled from top of lingual plating down to major connector (2 pts)
- c. Lingual contours of teeth followed (2 pts)
- d. Inlay wax blended into major connector with no line of demarcation (2 pts)

6. Mandibular denture base retention applied

- a. Design of outer border followed using 12 gauge 1/2 round wax with flat side down or mesh pattern (2.5 pts)
- b. 12 ga.1/2rd for cross struts or mesh pattern (2.5 pts)
- c. Attatchment areas not thinned out (2.5 pts)
- d. Tissue stop connected to outer border (2.5 Pts)

7. Mandibular minor connectors/rests waxed

- a. Rest preparation waxed to fill in design(thickness 1 to 1.5 mm) (4 pts)
- b. Minor connector approximately 1 mm thick staying within the boundaries of design and rounded at the connector of bottom edge of clasp (3 Pts)
- c. Junction of rest and connector 90 degrees to plane of occlusion (3 pts)

8. Mandibular finish lines applied

- a. Finish line positioned about 1.0 to 1.5 mm lingual to internal finish lines (4 pts)
- b. Use 18 gauge round (3 pts)
- c. Blended into rest and open ends sharpened (3 pts)

9. Mandibular clasps applied

- a. Tacky liquid applied to clasp (2 pts)
- b. Clasp tip positioned on ledge (2 pts)
- c. Clasp curved up towards the rest (2 pts)
- d. Shoulder of clasp same height as top edge of rest preparation or top of minor connector (2 pts)
- e. Borders of clasp neat no excess wax or tacky liquid (2 pts)
- f. Clasps follow original design (2 pts)
- g. Clasps adapted well to refractory model (3 pts)
- h. Clasps maintain proper taper without distortions (2 pts)
- i. All clasp components connected to the framework (3 pts)
- 10. Time constraints met (10 pts)

TOTAL = 100 POINTS REMOVABLE PARTIAL DENTURES PROJECT NUMBER TEN (PRACTICAL LABORATORY)

I. Instructions:

- A. Sprue maxillary and mandibular wax-ups
- B. Invest Maxillary and mandibular wax-ups
- C. Burn-out investment molds
- D. Cast maxillary and mandibular frameworks

II. Grading

- 1. Maxillary sprue lead attached
 - a. 6 gauge round wax sealed to refractory (5 pts)
 - b. Thin and fanned at point of attachment with major connector (5 pts)
 - c. Sprue lead thickest at attachment to sprue base (5 pts)
 - d. No irregularity in wax sprue lead (5 pts)

2. Mandibular sprue lead attached

- a. 6 gauge round wax sealed to refractory (5 pts)
- b. Thin and fanned at point of attachment with major connector (5 pts)
- c. Sprue lead thickest at attachment to sprue base (5 pts)
- d. No irregularity in wax sprue lead (5 pts)

3. Max wax-up invested

- a. Pattern sprayed with debubblizer (2 pts)
- b. Investment ring a and base coated with Vaseline (2 pts)

- c. Investment ring correctly positioned on base (2 pts)
- d. Correct liquid to powder ratio used (3 pts)
- e. Investment mixed according to manufacturers directions (2 pts)
- f. Investment ring filled quickly without trapping air bubbles (3 pts)
- g. Equipment and work area cleaned up after investing (2 pts)
- h. Mold removed from ring after reaching final set (2 pts)
- i. Mold labeled with students name (2 pts)

4. Man wax-up invested

- a. Pattern sprayed with debubblizer (2 pts)
- b. Investment ring a and base coated with Vaseline (2 pts)
- c. Investment ring correctly positioned on base (2 pts)
- d. Correct liquid to powder ratio used (3 pts)
- e. Investment mixed according to manufacturers directions (2 pts)
- f. Investment ring filled quickly without trapping air bubbles (3 pts)
- g. Equipment and work area cleaned up after investing (2pts)
- h. Mold removed from ring after reaching final set (2 pts)
- i. Mold labeled with students name (2 pts)
- 5. Molds placed in burnout oven (5 pts)
- 6. **Casting procedures** (5 pts)
- 7. **Time constraints met** (10 pts)

TOTAL = 100 POINTS

REMOVABLE PARTIAL DENTURES PROJECT NUMBER ELEVEN (PRACTICAL LABORATORY)

- I. Instructions:
 - A. Soak maxillary master cast with SDS prior to duplication
 - B. Prepare cast in duplicating flask
 - C. Fill duplicating flask with hydrocolloid material
 - D. Follow cooling procedures
 - E. Prepare investment prior to pouring time
 - F. Remove cast from duplicating material and place sprue former
 - G. Pour refractory model
 - H. Recover refractory model
 - I. Clean duplicating material and flasks
 - J. Trim refractory model
 - K. Dehydrate refractory model
 - L. Seal refractory model
- II. Grading
- A. Maxillary cast 2nd refractory model
 - 1. Casts soaked
 - a. Casts placed in 6 mm deep SDS, soaked overnight (1pt)

- b. Hygrobath warmed to 90° (+/- 2°) for 30 minutes (1pt)
- 2. Maxillary/Mandibular casts removed from water bath
 - a. Excess water blown off cast (1pt)
 - b. Relief pads still in correct position (4pts)

3. Maxillary/Mandibular casts centered in flasks

- a. Student's name marked on flask with china marker (2pts)
- b. At least 12mm clearance from casts to sides of flask (2pts)
- c. Casts secured with block-out clay (2pts)
- 4. Maxillary/Mandibular flasks filled with hydrocolloid
 - g. Flask filled until hydrocolloid reaches vent holes (2pts)
 - h. Flask bench cooled for 10 minutes (2pts)
 - i. Excess hydrocolloid removed prior to placement in cool water bath (4pts)

5. Maxillary/Mandibular flasks cooled

- a. Water level in tray not above base of flask (2pts)
- b. Removal time marked on flask (30 min cooling time) (4pts)
- 6. **Investment material prepared**
 - a. Investment material accurately measured and measurement recorded (5pts)
 - b. Amount of water and special liquid accurately measured and measurement recorded (5pts)
- 7. Maxillary/Mandibular flasks warmed after cooling cycle (10min) (2pts)
- 8. Maxillary/Mandibular casts removed from the hydrocolloid
 - a. Cast removed from hydrocolloid without distortion or tearing of material (5pts)
 - b. Sprue former positioned. centered 7-8mm away from major connector (5pts)

9. Maxillary/Mandibular refractory casts poured

- a. Investment properly mixed (2pts)
- b. Investment spot filled into mold, not flowed around mold (2pts)
- c. Investment not touching flask (2pts)
- d. Hydrocolloid removed from flask cleaned and returned to sealed container (2pts)

10. Maxillary/Mandibular refractory cast recovered

- a. Surface of cast not distorted (2pts)
- b. No negative bubbles within design of partial (2pts)
- c. Positive bubbles removed (2pts)
- d. Sprue holes smoothed (2pts)

11. Hydrocolloid recovered

- a. Rinsed under water to remove investment (5pts)
- b. Stored in sealed container (2pts)
- c. Flask cleaned and ready for next use (2pts)

12. Maxillary/Mandibular refractory casts trimmed

- a. Line drawn 6 mm from outer limits of design with a wax pencil (2pts)
- b. Cast trimmed at 45 degree angle to line mentioned above, except for heel area which is 90 degrees (2pts)
- c. Slurry rinsed off cast with SDS (2pts)

13. Casts dehydrated

- a. Minimum 30 minutes (2pts)
- b. Temp 180°F to 200°F (2pts)
- 14. Casts wax-dipped

- a. Wax temperature 280° 300°F (2pts)
- b. Excess wax blown off (2pts)
- c. Refractory casts placed on absorbent paper to cool (2pts)
- 15. **Time constraints met** (10pts)

TOTAL = 100 POINTS

REMOVABLE PARTIAL DENTURES PROJECT NUMBER TWELVE (PRACTICAL LABORATORY)

I. Instructions:

- A. Soak cast with SDS prior to duplication
- B. Prepare cast in duplicating flask
- C. Fill duplicating flask with hydrocolloid material
- D. Follow cooling procedures
- E. Prepare investment prior to pouring time
- F. Remove cast from duplicating material and place sprue former
- G. Pour refractory model
- H. Recover refractory model
- I. Clean duplicating material and flasks
- J. Trim refractory model
- K. Dehydrate refractory model
- L. Seal refractory model

II. Grading

- A. Mandibular cast 2nd refractory model
 - 1. Casts soaked
 - a. Casts placed in 6 mm deep SDS, soaked overnight (1pt)
 - b. Hygrobath warmed to 90° (+/- 2°) for 30 minutes (1pt)
 - 2. Maxillary/Mandibular casts removed from water bath
 - a. Excess water blown off cast (1pt)
 - b. Relief pads still in correct position (4pts)

3. Maxillary/Mandibular casts centered in flasks

- a. Student's name marked on flask with china marker (2pts)
- b. At least 12mm clearance from casts to sides of flask (2pts)
- c. Casts secured with block-out clay (2pts)
- 4. Maxillary/Mandibular flasks filled with hydrocolloid
 - j. Flask filled until hydrocolloid reaches vent holes (2pts)
 - k. Flask bench cooled for 10 minutes (2pts)
 - 1. Excess hydrocolloid removed prior to placement in cool water bath (4pts)
- 5. Maxillary/Mandibular flasks cooled
 - a. Water level in tray not above base of flask (2pts)
 - b. Removal time marked on flask (30 min cooling time) (4pts)
- 6. Investment material prepared
 - a. Investment material accurately measured and measurement recorded (5pts)
 - b. Amount of water and special liquid accurately measured and measurement recorded

(5pts)

- 7. Maxillary/Mandibular flasks warmed after cooling cycle (10min) (2pts)
- 8. Maxillary/Mandibular casts removed from the hydrocolloid
 - a. Cast removed from hydrocolloid without distortion or tearing of material (5pts)
 - b. Sprue former positioned. centered 7-8mm away from major connector (5pts)

9. Maxillary/Mandibular refractory casts poured

- a. Investment properly mixed (2pts)
- b. Investment spot filled into mold, not flowed around mold (2pts)
- c. Investment not touching flask (2pts)
- d. Hydrocolloid removed from flask cleaned and returned to

sealed container (2pts)

10. Maxillary/Mandibular refractory cast recovered

- a. Surface of cast not distorted (2pts)
- b. No negative bubbles within design of partial (2pts)
- c. Positive bubbles removed (2pts)
- d. Sprue holes smoothed (2pts)

11. Hydrocolloid recovered

- a. Rinsed under water to remove investment (5pts)
- b. Stored in sealed container (2pts)
- c. Flask cleaned and ready for next use (2pts)

12. Maxillary/Mandibular refractory casts trimmed

- a. Line drawn 6 mm from outer limits of design with a wax pencil (2pts)
- b. Cast trimmed at 45 degree angle to line mentioned above, except for heel area which is 90 degrees (2pts)
- c. Slurry rinsed off cast with SDS (2pts)

13. Casts dehydrated

- a. Minimum 30 minutes (2pts)
- b. Temp 180°F to 200°F (2pts)

14. Casts wax-dipped

- a. Wax temperature 280° 300°F (2pts)
- b. Excess wax blown off (2pts)
- c. Refractory casts placed on absorbent paper to cool (2pts)
- 15. **Time constraints met** (10pts)

TOTAL = 100 POINTS

REMOVABLE PARTIAL DENTURES PROJECT NUMBER THIRTEEN (PRACTICAL LABORATORY)

I. Instructions:

- A. Transfer maxillary design from master cast to 2nd refractory model
- B. Wax refractory model following design using preformed patterns and inlay wax

II. Grading

1. **Designs transferred to refractory casts**

- a. Original designs followed (4 pts)
- c. Cast not scraped with pencil (3 pt)
- c. Clasps tips drawn into ledges (3 pts)

2. Maxillary preparatory wax-up completed

- a. Beadlines filled even with tissue surface (1 pt)
- b. Wax flowed onto crest of rugae (1 pt)
- c. Wax flowed along relief pad to form a ramp (internal finish line) (1 pt)
- d. Tissue stop filled even with relief pad (1 pt)
- e. 24 gauge sheet casting wax adapted \sim 1mm onto relief pad and blended into ramp of internal finish line (1 pt)

3. Maxillary denture base retention applied

- a. Design of outer border followed using 12 gauge 1/2 round wax with flat side down, maintaining thickness of wax (1 pt)
- b. 12 ga.1/2rd for cross struts (1 pt)
- c. Wax flared at areas of attachment with no thin spots (2 pts)
- d. Tissue stop connected to outer border (1 pt)

4. Maxillary finish lines applied

- a. Finish line positioned 1.0 to 1.5mm lingual to internal finish lines (2 pts)
- b. 18 gauge round wax used (1 pt)
- c. Blended into rest and open ends sharpened (2 pts)

5. **Tube Tooth waxed-up**

- a. Separator applied (1 pt)
- b. Post preparation filled with wax (no voids) (2 pts)
- c. Post sealed to ridge (1 pt)
- d. No voids in wax under tooth (2 pts)
- e. Centric occlusion checked (1 pt)
- f. Lingual contours adequately waxed (2 pts)
- g. Buccal collar adequately trimmed (1 pt)

6. Metal Backing waxed

- a. Centric occlusion checked (1 pt)
- b. Proper lingual contours followed (2 pts)
- c. Incisal edge in line with curvature of abutment teeth (1 pt)
- d. Incisal height matches other lateral (2 pts)
- e. Length of ridge lap matches length of other lateral (2 pts)
- f. lingual anatomy smooth (1 pt)
- g. Labial hollowed out wax thickness between 0.5 and 1.0mm (1 pt)

7. Maxillary lingual plating outlined

- a. Edges of lingual plating design sealed to refractory model (2 pts)
- b. Approximately 0.5 1 mm thickness (2 pts)

8. Maxillary lingual plating completed

- a. Even thickness of wax filled from top of lingual plating down to major connector (2 pts)
- b. Lingual contours of teeth followed (2 pts)
 - c. Inlay wax blended into stipple sheet with no line of demarcation (2 pts)

9. Maxillary major connector adapted

- a. Stippled surface up (1 pt)
- b. Major connector design area covered without going up on linguals of teeth (1 pt)

- c. Stipple sheet extended beyond bead line to allow for finishing (2 pts)
- d. No air trapped under stipple sheet (2 pts)
- e. Cast not scribed by knife (1 pt)
- f. Wax pattern not thinned out or distorted (1 pt)
- g. Entire pattern sealed (2 pts)

10. Maxillary minor connectors/rests waxed

- a. Rest preparation waxed to fill in design(approximate thickness 1 to 1.5 mm) (2 pts)
- b. Minor connector approximately 1 mm thick staying within the boundaries of design and rounded at the connector of bottom edge of clasp (2 pts)
- c. Junction of rest and connector should be 90 degrees to plane of occlusion (1 pt)

11. Maxillary clasps applied

- a. Tacky liquid applied to clasp (2 pts)
- b. Clasp tip positioned on ledge (2 pts)
- c. Clasp curved up towards the rest (2 pts)
- d. Shoulder of clasp same height as top edge of rest preparation or top of minor connector (2 pts)
- e. Approach arm of infrabulge clasp properly positioned (2 pts)
- f. Borders of clasp neat no excess wax or tacky liquid (2 pts)
- g. Clasps follow original design (2 pts)
- h. Clasps adapted well to refractory model (2 pts)
- i. Clasps maintain proper taper without distortions (2 pts)
- j. All clasp components connected to the framework (2 pts)
- 12. **Time constraints met** (10 pts)

TOTAL = 100 POINTS

REMOVABLE PARTIAL DENTURES PROJECT NUMBER FOURTEEN (PRACTICAL LABORATORY)

I. Instructions:

- A. Transfer mandibular design from master cast to refractory model
- B. Wax refractory model following design using preformed patterns and inlay wax

II. Grading

1. **Designs transferred to refractory casts**

- a. Original designs followed (4 pts)
- c. Cast not scraped with pencil (3 pts)
- c. Clasps tips drawn into ledges (3 pts)

2. Mandibular preparatory wax-up completed

- a. Wax flowed along relief pad to form a ramp (internal finish line) (4 pts)
- b. Wax flashed over major connector design area (3 pts)
- c. Tissue stop filled even with relief pad (3 pts)

3. Mandibular major connector adapted to refractory cast

a. $6 \text{ ga } \frac{1}{2} \text{ pear plastic pattern adapted to bottom edge of design line (2.5 pts)}$

- b. Ends of major connector cut at 45 degree angle (2.5 pts)
- c. Plastic pattern sealed with inlay wax (2.5pts)
- d. Fishtail waxed in next to open retention (2.5 pts)

4. Mandibular lingual plating outlined

- a. Edges of lingual plating design sealed to refractory model (2 pts)
- b. Approximately 0.5 1 mm thickness (2 pts)

5. Mandibular lingual plating completed

- a. Even thickness of wax filled from top of lingual plating down to major connector (2 pts)
- c. Lingual contours of teeth followed (2 pts)
- d. Inlay wax blended into major connector with no line of demarcation (2 pts)

6. Mandibular denture base retention applied

- a. Design of outer border followed using 12 gauge 1/2 round wax with flat side down or mesh pattern (2.5 pts)
- b. 12 ga.1/2rd for cross struts or mesh pattern (2.5 pts)
- c. Attatchment areas not thinned out (2.5 pts)
- d. Tissue stop connected to outer border (2.5 Pts)

7. Mandibular minor connectors/rests waxed

- a. Rest preparation waxed to fill in design(thickness 1 to 1.5 mm) (4 pts)
- b. Minor connector approximately 1 mm thick staying within the boundaries of design and rounded at the connector of bottom edge of clasp (3 Pts)
- c. Junction of rest and connector 90 degrees to plane of occlusion (3 pts)

8. Mandibular finish lines applied

- a. Finish line positioned about 1.0 to 1.5 mm lingual to internal finish lines (4 pts)
- b. Use 18 gauge round (3 pts)
- c. Blended into rest and open ends sharpened (3 pts)

9. Mandibular clasps applied

- a. Tacky liquid applied to clasp (2 pts)
- b. Clasp tip positioned on ledge (2 pts)
- c. Clasp curved up towards the rest (2 pts)
- d. Shoulder of clasp same height as top edge of rest preparation or top of minor connector (2 pts)
- e. Borders of clasp neat no excess wax or tacky liquid (2 pts)
- f. Clasps follow original design (2 pts)
- g. Clasps adapted well to refractory model (3 pts)
- h. Clasps maintain proper taper without distortions (2 pts)
- i. All clasp components connected to the framework (3 pts)
- 10. Time constraints met (10 pts)

TOTAL = 100 POINTS

INSTRUCTIONAL OBJECTIVES - RESD 1216 REMOVABLE PARTIAL DENTURES - LECTURE

I. INTRODUCTION TO REMOVABLE PARTIAL DENTURES - One Lecture Hour

- A. CONDITIONS: Given a lecture and discussion using slides, visual aids and reading assignments on the terminology, classification of removable partial dentures, impression materials, and outline of clinical and laboratory procedures, for partial dentures.
- B.
- A.

B. PERFORMANCE:

The students will be expected to:	
1. Define removable partial de	entures.

- 2. Identify and cite the rationale for unilateral, bilateral, free end saddle, tooth and tissue supported and all tooth supported dentures.
- 3. Describe the clinical and laboratory procedures for fabricating a partial denture including infection control procedures.
- 4. Describe the procedure for fabricating a custom made impression tray for a partial denture.
- 5. Cite and identify the impression materials used for partial dentures.
- 6. Describe the safety procedures and equipment used for fabricating a custom impression tray for a R.P.D.

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

II. CLASSIFICATION COMPONENT PARTS OF A OF REMOVABLE PARTIAL DENTURES - One Lecture Hour

A. CONDITIONS:	Given a lecture and discussion using slides, visual aids and reading assignments on the various classifications and modifications of removable partial dentures.
B. PERFORMANCE:	 The student should be able to: Cite the various classifications of partial dentures. Describe the various modifications in each classification. Describe the partial denture required for each classification.
C. EXTENT & CRITERIA:	With at least 70% accuracy at the end of one lecture hour.
III. CONSTRUCTION OF THE	E MASTER CASTS - One Lecture Hour
A. CONDITIONS:	Given a lecture and discussion using slides, visual aids and reading assignments on the construction of the master cast and articulation.
B. PERFORMANCE:	The student should be able to: 1. Describe the material and

- procedure for construction of the master cast.
- 2. Cite the reasons for articulation.
- 3. Cite the procedure for articulating the master casts.
- C. EXTENT

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

IV. SURVEYING PARTIAL DENTURES - One Lecture Hour

- A. CONDITIONS: Given a lecture and discussion using slides, visual aids and reading assignments on planning the partial denture and surveying the master casts.
- B. PERFORMANCE: The student should be able to:
 - 1. Describe the procedure for surveying the master casts.
 - 2. Cite the areas of the master casts to be surveyed.

3. Describe the parts of the surveyors and cite their purposes.

C. EXTENT

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

* QUIZ DURING 5TH LECTURE HOUR

V. <u>REMOVABLE PARTIAL DENTURE DESIGNS</u> - Two Lecture Hours

A. CONDITIONS: Given a lecture and discussion using slides, visual aids and reading assignments on designing partial dentures.

B. PERFORMANCE: The student should be able to:

- 1. Cite the conditions for using a specific partial denture design
- 2.Describe the components included in the design
- 3. Cite the conditions in the mouth that require the design

C. EXTENT

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

VI. PARTIAL DENTURE CLASP COMPONENTS - One Lecture Hour

A. CONDITIONS:	Given a lecture and discussion using
	slides, visual aids and reading
	assignments on clasp components

B. PERFORMANCE: The student should be able to:

- 1. Describe the conditions that exist for using a specific clasp
- 2. Describe the positions on the teeth where the parts of a clasp are placed
- 3. Cite the various types of clasps and their shapes
- C. EXTENT & CRITERIA: With at least 70% accuracy at the end of one lecture hour

* MIDTERM AFTER 7TH LECTURE HOUR.

VII. RELIEF AND DUPLICATION OF MASTER CASTS - Two Lecture Hour

A. CONDITIONS: Given a lecture and discussion using slides, visual aids and

reading assignments on relief and duplication of the master cast.

B. PERFORMANCE: The student should be able to:

- 1. Describe the procedure and
 - reasons for relief of the master casts.
- 2. Cite where relief is placed on the master casts.
- 3. Describe the procedure for duplication of the master casts.
- C. EXTENT

& CRITERIA: With at least 70% accuracy at the end of two lecture hour.

VIII. <u>REFRACTORY CASTS, DRYING, DIPPING, AND APPLYING PREFORMED</u> <u>PATTERNS</u> - Two Lecture Hours

A. CONDITIONS: Given a lecture, discussion and a slide presentation, with reading assignments on drying and dipping the refractory cast and applying the preformed patterns.
 B. PERFORMANCE: The student should be able to:

- 1. Describe the procedures for drying and dipping a
 - refractory cast.
 - 2. Cite the positions to place the preformed patterns.
 - 3. Describe the reasons for the positions of the
 - preformed patterns.
- C. EXTENT & CRITERIA: With at least 70% accuracy at the end of two lecture hours.

IX. INVESTING AND CASTING PROCEDURES - Two Lecture Hours

A. CONDITIONS:	Given a lecture and discussion
	using slides, visual aids and
	reading assignments on investing
	and casting procedures for high
	heat metals.

B. PERFORMANCE: The student should be able to:

- 1. Describe the investing procedure including preparing the ring and wax pattern.
- 2. Describe the burn-out procedure including reasons and temperatures.
- 3. Cite the casting procedure and removal of casting from the ring.

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

FINAL EXAM - ONE LECTURE HOUR <u>INSTRUCTIONAL OBJECTIVES</u> <u>REMOVABLE PARTIAL DENTURES - LABORATORY</u>

I. <u>INTRODUCTION TO REMOVABLE PARTIAL DENTURES</u> – Two laboratory session

A. CONDITIONS: Given a demonstration and reading assignments on laboratory infection control procedures, removal partial denture materials and preliminary casts and using the following equipment and supplies:

EQUIPMENT & SUPPLIES:

*

- 1. Personal protective equipment
- 2. Disinfectant material
- 3. Impressions
- 4. plaster or stone
- 5. plaster spatula
- 6. plaster bowl
- 7. murphy knife
- 8. model trimmer

B. PERFORMANCE: The student should be able to:

- 1. Perform infection control procedures
- 2. Accurately measure materials for poring models
- 3. Pour models free of voids
- C. EXTENT & CRITERIA: The following points will be evaluated on the casts.
 - 1. completion of infection control procedures
 - 2. measurements of materials accurately made and recorded
 - 3. The casts should be dense and bubble free
 - 4. The casts should be without distortion or broken teeth.

With at least 70% accuracy at the end of one session.

- II. CLASSIFICATION OF REMOVABLE PARTIAL DENTURES Two Laboratory Sessions
 - A. CONDITIONS: Given a demonstration and reading assignments on classifications of partial dentures using the following equipment and supplies:

EQUIPMENT & SUPPLIES:

1. B. PERFORMANCE:	 Casts pencil 3. murphy knife The student should be able to identify and outline the casts.
C. EXTENT & CRITERIA	 A: The following points will be evaluated in the design. 1. The correct casting design selected. 2. Bead line positioned correctly. With at least 70% accuracy at the end of two laboratory sessions.
III. <u>CONSTRUCTION OF THE M</u> Four Laboratory Sessions	MASTER CASTS AND ARTICULATION -
A. CONDITIONS:	Given a demonstration and reading assignments on pouring the master casts, articulating, using the following equipment and supplies:
EQUIPMENT & SUPPLIES: B. PERFORMANCE:	 final impressions stone plaster spatula plaster bowl plaster large stone Lathe articulator vaseline bunsen burner #31 spatula The student should be able to pour the master casts, and articulate the casts.
C EXTENT	the muster custs, and articulate the custs.
&CRITERIA:	 The following points will be evaluated: The master casts should be dense and bubble free. The articulation should be neat and have the correct bite.

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

IV. SURVEYING PARTIAL DENTURE CASTS - Three Laboratory Sessions

	A. CONDITIONS:	Given demonstrations and reading assignments on surveying the master casts, using the following equipment and supplies:
	EQUIPMENT & SUPPLIES:	 surveyor pencil master casts block out wax bunsen burner #7 spatula
	B. PERFORMANCE:	The student should be able to survey the master casts, find the path of insertion, undercuts and block out undesirable undercuts.
	C. EXTENT &CRITERIA:	 The following points will be evaluated. The position of the survey lines. The undesirable undercuts blocked out. The desirable undercuts to be used With at least 70% accuracy at the and of three laboratory assessions.
V. Session	REMOVABLE PARTL	AL DENTURE DESIGNS - Three Laboratory
	A. CONDITIONS: desig following equ	Given demonstrations and reading assignments on ns of major and minor connectors, using the ipment and supplies:
	EQUIPMENT &	

SUPPLIES:

- 1. pencil 2. master casts
- 3. murphy knife
- B. PERFORMANCE: The student should be able to design the master casts.

C. EXTENT

The following points will be evaluated. & CRITERIA: 1. The selection of the designs.

2. The placement of the bead lines. With at least 70% accuracy at the end of three laboratory sessions.

VI. <u>PARTIAL DENTURES CLASP COMPONENTS</u> - Three Laboratory Sessions

A. CONDITIONS: Given demonstrations and reading assignments on clasp components, using the following equipment and supplies:

EQUIPMENT & SUPPLIES: 1. pencil

2. master casts

B.	PERFORMANCE:	The student should be able to place the clasp
		components in correct areas.

- C. EXTENT & CRITERIA: The following points will be evaluated:
 - 1. The position of the retention, bracing and support portions of the clasp.
 - 2. The type of clasp selected.
 - 3. The selection of attachments.

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

VII. <u>RELIEF AND DUPLICATION OF MASTER CASTS</u> - Five Laboratory Sessions

A. CONDITIONS: Given demonstrations and reading assignments on the application of relief wax and duplication of the cast for refractory models used to cast chrome-cobalt alloy using the following equipment and supplies:

EQUIPMENT & SUPPLIES:

- 1. Surveyor & block-out tool
- 2. Block-out was
- 3. relief wax
- 4. bunsen burner
- 5. #7 spatula
- 6. duplicating flasks
- 7. clay
- 8. Hydrocolloid duplicating material
- 9. duplicating material melting unit
- 10. murphy knife

B. PERFORMANCE: The student should be able to place

1. prepare the casts for duplication

- 2. the relief wax in the correct areas,
- 3. and pour the duplicating material.

D. EXTENT & CRITERIA:

- The following points will be evaluated 1. the undercut areas blocked out
- 2. the position of the relief wax
- flasking of the master casts
 the duplicated mold

With at least 70% accuracy at the end of five laboratory sessions.

VIII. REFRACTORY CASTS, DRYING, DIPPING AND WAXING - Four Laboratory Sessions

A. CONDITIONS: Given demonstrations and reading assignments on making the refractory casts, drying, dipping and waxing the refractory casts. Using the following equipment and supplies:

EQUIPMENT & SUPPLIES:

- 1. investment powder
- 2. investment liquid
- 3. drying oven
- 4. rosin or beeswax
- 5. bunsen burner
- 6. #7 spatula
- 7. plaster spatula
- 8. rubber bowl
- 9. colored pencil
- 10. tacky liquid
- 11. preformed patterns
- 12. inlay wax
- 13. refractory casts
- 14. wax sprues (8 gauge)
- B. PERFORMANCE: The student should be able to
 - 1. fabricate the refractory casts,
 - 2. dehydrate and seal the refractory casts
 - 3. transfer design to refractory model
 - 4. apply the preformed patterns.

E. EXTENT

& CRITERIA:

The following points will be evaluated:

- 1. A refractory cast bubble free and without broken teeth
- 2. The dipping procedure and surface of the refracture casts
- 3. The placement of the preformed patterns and wax
- 4. The placement of the sprues
- 5. Application of the protective coating

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

IX. INVESTING AND CASTING PROCEDURES - Five Laboratory Sessions

Α.	CONDITIONS:	Give inve the f	en demonstrations and reading assignments on sting and casting partial denture wax-ups. Using following equipment and supplies:
	EQUIPMENT & SUPPLIE	ES:	
		1.	investment powder
		2.	investment liquid
		3.	investment ring
		4.	mixing spatula
		5.	mixing bowl
		6.	vibrator
		7.	casting machine
		8.	partial denture alloy
		9.	crucible
		10.	casting tongs

11. heat resistant casting gloves

B. PERFORMANCE:

The student should be able to invest the refractory casts, and cast the partial dentures.

- C. EXTENT & CRITERIA: The fo
 - The following points will be evaluated:
 - 1. documentation of investing procedures
 - 2. the burnout
 - 3. the casting procedure
 - 4. the finished casting without failures

With at least 70% accuracy at the end of five laboratory sessions.