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

COURSE CODE & TITLE: RESD 2310 Principles of Occlusion

DEPARTMENT: RESTORATIVE DENTISTRY

LECTURE INSTRUCTOR Prof. Jules Balla
Email: gyula.balla73@login.cuny.edu
Phone: 718 260-5137
Office Hours: TBA

Office Hours. Students are encouraged to come by, either individually or in groups, to discuss assignments, clarify class topics or problems, share ideas and concerns, review tests, or address any other matters that might be helpful. Office hours held by faculty are specifically offered for student use and are an important part of student's education.

RESD 2310 Syllabus revised: August 2024 by: Professor N. Manos

COURSE DESCRIPTION: This course is designed to provide the student with an introduction to the principles of occlusion, including the anatomical structures of the oral cavity, the determinants of occlusal morphology and the physiology of the mandibular movements as they relate to the fabrication of dental restorations. The laboratory portion of this course will provide exercises in cusp to fossa and cusp to marginal ridge waxing.

CLASS CREDITS: 3 credits
CLASS HOURS: 1 laboratory sessions - 3 lab hours per week;
1 lecture hour in class or online per week; minimum of 2 visits in Blackboard per week;

NUMBER OF WEEKS: 15 Weeks

CURRICULUM LEVEL: Third Semester

PREREQUISITES: RESD 1110

REQUIREMENTS: Standard college and department regulations.
Proper uniform and conformity to safety regulations and netiquette

Conformity to netiquette (online etiquette).
Students who participate in this class with their camera on or use a profile image are agreeing to have their video or image recorded solely for the purpose of creating a record for students enrolled in the class to refer to, including those enrolled students who are unable to attend live. If you are unwilling to consent to have your profile or video image recorded, be sure to keep your camera off and do not use a profile image. Likewise, students who un-mute during class and participate orally are agreeing to have their voices recorded. If you are not willing to consent to have your voice recorded during class, you will need to keep your mute button activated and communicate exclusively using the "chat" feature, which allows students to type questions and comments live.

QUIZZES AND EXAMINATIONS: Students are responsible for knowing all information covered in reading assignments, handouts, lecture and laboratory. Students are responsible for knowing information from reading assignments regardless of whether it was covered during class sessions or not. In addition to the major exams, there will be quizzes/assessments/projects that will be conducted during each session. They will be based on prior sessions and reading assignments. There will be no makeup for missed course work.

HYBRID COURSES: Information related to City Tech hybrid education, and student workshops can be found directly on Blackboard and will be explained by lecture instructor during the first lecture.
The lecture and laboratory sessions will be conducted either in-person or virtually in Blackboard, or through other platforms. Questions should be directed to the instructor teaching the section or the course coordinator.

HYBRID PARTICIPATION: The laboratory sessions will meet in scheduled classroom and at the scheduled time.

The lecture session will be conducted as a partially online class. Online lectures, will take place in the virtual classroom located in Blackboard. The dates for online meetings are posted in course syllabus. Students are expected to contribute regularly (at least once a week) and complete all assigned work before or on the due date.
ASSIGNMENT/ASSESSMENTS/POSTS SUBMITTED PAST DUE DATES WILL RECEIVE 0 GRADE AND WILL COUNT AS AN ABSENCE FROM CLASS.

TEXTBOOKS: Waxing Manual ,Tooth to Tooth Occlusion, Thorney and Hunt, Harmony O

Press San Mateo, Calif.94402

Dental Laboratory Technology, Basic sciences ,removeable prosthodontics, and orthodontics 2005 Air Force Pamphlet 47-103, Vol.1
TMJ Occlusion and Function. Georgetown, Washington DC: University School of Dentistry

REFERENCES: Introduction to Occlusal Anatomy, Lundeen, L and J Press, Gainsville ,Fl.
A textbook of Dental Anatomy, Physiology and Occlusion, Wheeler, W.B. Saunders and Co., Philadelphia, Pa. 5th Ed

WEB REFERENCES: Assorted videos on utube on PKT waxing techniques

VIDEOS: Semi adjustable articulators:Whip Mix 8500 Videos, Stratos videos, face bow transfer, Quick mount, Recording Centric Relations Part 1 and 2.-City Tech Library.

RESTORATIVE DENTISTRY POLICIES – RESTORATIVE DENTISTRY POLICIES

Students attending Restorative Dentistry in-person, hybrid or online courses will be required to adhere to the following 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.
2. Plagiarism in lecture or laboratory assignments, exams or projects will not be accepted. Student will not receive a grade if papers, exams or assignments were done by someone else or completed in ways other than stated in course documentation. The department will adhere and follow the Academic Integrity Policy and Procedures as per NYCCT & CUNY Policies.
3. Students are responsible for knowing all material covered in reading assignments and handouts for both lecture and laboratory. Students are responsible for knowing information from reading assignments regardless of whether it has been covered during class sessions or not.
4. RESD students are responsible for being in class on time and for participation in laboratory demonstrations. Failure to observe laboratory demonstrations may affect student's performance and contribute to the failure of the course.

NYCCT REASONABLE ACCOMODATIONS

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

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.

- It is strongly advised that students are present for all classes during the semester including 30 laboratories and 15 lectures.
- Classes will begin promptly at the scheduled time.
- Students enrolled in RESD course must meet all course requirements as stated in course syllabus in order to pass it. Failure to submit or complete the assignments, tasks, projects or exams by specified due date~~s~~, place and time will result in a zero (0) grade and possible failure of the course.
- Make-up exams, projects, assessments will not be issued. If student requires reasonable accommodations, proper documentation from the Center for Student Accessibility should be submitted to the instructor within reasonable time to fulfill course requirements before semester ends.
- The students are required to observe course instructor's demonstrations and complete all fabrication tasks under course instructor's supervision. Laboratory demonstrations are usually conducted at the beginning of the session and cannot be redone for the convenience of the student who arrives late, walks out of the classroom, or is absent.
- When student is given instructor's permission to leave the class, the student must return to class in a reasonable time.

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%.

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 requiring the full duration and fulfillment of all requirements of the lecture and laboratory sections of the course. Failure to satisfactorily complete a repeated RESD course will be considered a failure to maintain satisfactory progress in the major and will result in dismissal from the major.**

PROFESSIONALISM & ETHICS

1. Since practice of dentistry carries with it a high degree of responsibility, a mature, professional, and ethical conduct is expected of all students at all times (lecture & laboratory sessions, hybrid & online sessions, externship sites, professional events/seminars, etc.). Unprofessional behavior that shows inattentiveness and disrespect for others will be taken into consideration during the grading process. Points may be deducted at the discretion of any faculty member regardless of what course is in session. This includes incidents in the hallways, by lockers, or anywhere on NYCCT campus. Students will conduct themselves in a professional manner. No horseplay, offensive language, shouting or any other misconduct will be allowed.
2. Netiquette: Online Etiquette-Students will conduct their online posts and replies with respect for others, which include courtesy, dignity, and appropriate language at all times. Inappropriate behavior of any kind in online settings will not be tolerated and will negatively affect student's grade.
3. All faculty members will be addressed by their proper title.
4. Students are required to use proper dental terminology when discussing dental prosthesis.
5. Students are to have all required instruments and supplies when attending laboratory sessions.
6. Students are not permitted to do other students' work although assistance and teamwork are strongly encouraged.
7. All electronic devices must be turned off during all RESD classes unless otherwise specified by the instructor.
8. Each RESD student will be assigned a locker in the beginning of each semester and will vacate the locker by the last day of the semester. If the locker is not returned back in clean condition by the end of the semester, the locker will be broken by CLT. The student will not receive another locker the next semester.
9. Students should make arrangements to attend all department events and professional development seminars in which an invitation is extended. Students are strongly encouraged to attend events, professional development seminars and meetings sponsored by the department to elevate their knowledge, skills and understanding of the field of study.
10. Department offices and stock rooms contain sensitive and personal information, classroom materials, supplies and equipment, and should be used for official use only. Students and unofficial personnel should not be allowed in the department offices unless to fulfill official business.

DRESS, SUPPLIES & TEXTBOOKS

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

HEALTH & SAFETY

1. No eating, drinking or smoking is permitted in laboratories or classrooms.
2. No electronic devices (i.e. phones, headphones, computers or tablets) will be permitted in the laboratories or classrooms unless requested for classroom use by the instructor.
3. No outerwear, shopping bags, attaché cases, luggage etc., are permitted in laboratories.
4. Bunsen burners when lit are a potential danger. Bunsen burners must be turned off when you leave your bench. Long hair and hair spray are flammable items. Pay particular attention to any Bunsen burner flame. Do not lean over the open flame.
5. Chucks must be securely placed onto bench engine shaft to avoid chuck flying off when engine is turned on.
6. Boiling water can result in serious burns. Extra caution should be taken when boiling out or using boiling water.
7. Burnout furnaces and porcelain furnaces are potentially dangerous. Tongs should be used when picking up hot casting rings or ceramic work.
8. Students with long hair must wear a hairnet or tie back their long hair to prevent accidental burning from Bunsen burners or other serious accidents. Hair can easily get caught in hand piece or lathe.
9. Safety eye glasses must be worn by all occupants of the laboratory while any procedures are being conducted that produce dust or airborne particles. Safety eye glasses with side shields may be obtained from a hardware store. They are essential to the students' safety.
10. Eye protection measures should be taken when working with curing lights, lasers, and heating or melting metal.
11. Proper mask (N95) should be worn when grinding metals, ceramics, and acrylics or when using materials creating dust.
12. Students not enrolled in a RESD course, from this and other departments, will not be permitted to visit during laboratory sessions.
13. Students will not use any equipment until demonstrated by the instructor.

CLEANLINESS

1. Students must have a plastic place mat to protect bench top during laboratory sessions.
2. Students are required to clean-up working areas and equipment at the conclusion of any procedure. Timely clean-up is important to prepare the area for the next student and ensure equipment remains in working order. Especially important is that stone or investment is not allowed to harden in the sinks, in the mixing bowls or in contact with the equipment.
3. Each student is required to leave work station spotless by removing all debris, papers, wax, plaster, etc. from drawers, work station tops and floors in the immediate vicinity of the seat before leaving.
4. Each student is assigned responsibility for maintaining the cleanliness of an area used in common by all members of the class.
5. Equipment such as duplicating flasks, articulators or any other equipment that belongs to the department and is used by the student during the laboratory session or during the entire semester must be returned clean and in

good working condition otherwise the student is financially responsible for repaying broken or missing equipment, and hold may be placed throughout CUNY system for registration to any courses until the payment is made.

6. 5% of final grades will be deducted in each course for student who will not adhere to neatness, cleanliness and safety measures in the classroom.

ONLINE CLASS TECHNOLOGY PREREQUISITES

Below are the suggested minimum prerequisites for taking part in an online course:

1. You should have access and be able to use the internet browser.
2. You need access to a computer with internet connection; computers with internet access are available in numerous locations throughout the college (i.e. Library, Computer Lab G600, etc.)
3. You should have access and be comfortable using the college email account provided to each student free of charge. College email will be used as a primary source of course communication.

HELPFUL INFORMATION ON HOW TO ACCESS & NAVIGATE BLACKBOARD:

1. Visit Student Welcome Center in the Library Building on the first floor to seek assistance with Blackboard set up, password and access issues, etc.

2. Visit the student computer lab in the General Building, sixth floor, room G600. The phone number for the lab is (718) 254-8565.

3. Refer to Websupport 1 for a "Beginners Guide to BlackBoard." To enter this site:
   1. Access link: http://websupport1.citytech.cuny.edu/websupport1/It/online/students/index.html
      Or
   2. Go to the City Tech Home Page
   3. Click on "Quick Links"
   4. Go to "Helpful Links" and click on "Websupport 1"
   5. Click on "Instructional Technology Tutorials and Handouts"
   6. Scroll down and click "Beginners Guide to Blackboard Course Info"

4. College provides numerous student Blackboard training sessions throughout the semester

5. Use the description of the navigation of the Blackboard site:

ANNOUNCEMENTS - Entry point. Announcements will allow communication between instructor and student. The student should have clear instruction posted here about each lecture or lab, project, exam, emergency, etc. Students need to check announcements regularly. In asynchronous class (one that is not offered in real time) students need to check announcements regularly and complete assignments in timely manner to comply with set deadlines.

CONTACTS - information about course coordinator, lecture instructors and lab instructors for all sections of the course (i.e. phone, email, office location and so on). Online classroom is open 24 hours a day, 7 days a week. So if student wants to ask the coordinator/instructor a question, he/she can email or post it in discussion board it at any time. To discuss matter with the entire class, the student should post the question in designated Forum in Lecture/Lab Discussion section.

COURSE DOCUMENTS - includes syllabus, calendars with deadlines to complete the projects in lab or lecture portion of the course.

LECTURE or LABORATORY SESSIONS

LECTURE SESSIONS – includes lecture materials for each one of 15 lectures, i.e. power point presentations, articles, handouts, and videos related to specific lecture topics

LABORATORY SESSIONS – includes laboratory documentation to be fulfilled in each of 15 lab sessions i.e. instructions related to laboratory procedures and equipment, videos, lab notes, handouts, grading sheets, etc.

LECTURE or LABORATORY DISCUSSIONS– location of questions/comments, replies to questions /comments, assignments, essays, etc.

EXAMS - location of exam reviews and major exams: Quiz, Midterm & Final

OPTIONAL: Other Assessments, Essays, Reports, Projects, etc.

BOOKS – location of electronic books and handouts available for students use i.e. AFP

TOOLS - tools for updating personal information, checking your grades, and exchanging word processing files with classmates and instructor via the Digital Drop Box

LEARNING OUTCOMES FOR RESD 2310:

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

1. **Demonstrate** knowledge concerning the features and operations of semi-adjustable articulator
2. **Identify** the functions of the muscles of mastication including origins and insertions
3. **Identify** the anatomy and function of the temporomandibular joint, including ligaments
4. **Identify** the mandibular movements, including classification areas of rotation, types of motion, side shift and timing
5. **Identify** the nomenclature and theory inherent in occlusion
7. **Identify** the occlusal determinants including horizontal plane records and vertical dimensions
8. **Demonstrate** theoretical and practical knowledge of gnathological dentistry
9. **Develop the ability** to construct a maxillary and mandibular quadrant in cusp to marginal ridge occlusion
10. **Develop the ability** to construct a right and left maxillary and mandibular quadrant in cusp to fossa occlusion
11. **Identify** all centric stops for cusp-marginal ridge occlusion and cusp to fossa occlusion

GENERAL EDUCATION LEARNING OUTCOMES:

1. **Knowledge**:
   - develop broad based knowledge form a range of sources
   - continue building on the knowledge acquired in previous courses - develop ability to deepen and continue learning
2. **Skill**:
   - develop comprehension and proficiency needed for communication, inquiry, analysis, and productive work
3. **Values, Ethics and Relationships**:

- Professional/Personal development: demonstrate intellectual honesty and personal responsibility
- Ethics/Values: transform information into knowledge, and knowledge into judgment and action

ASSESSMENT:

To evaluate student achievement of the learning outcomes the professor will do the following:

1. **Assess** students use of professional vocabulary through testing and project completion
2. **Review** students abilities to follow instructions into the laboratory work by means of frequent lab project evaluations
3. **Conduct** multiple choice exams
4. **Evaluate** all exams and projects with emphasis on student's ability to communicate and use of professional vocabulary 5.

RESD 2310 ASSESSMENT & GRADING

LECTURE 40%

LABORATORY 60%

*TOTAL - FINAL GRADE 100%

* Additional projects may be available
* Participation will be based on alertness in class, participation in class discussion, and homework. * Final grade will be computed on the basis of 60% of laboratory grade and 40% of lecture grade. Each individual's performance will be assigned a conventional letter grade.
* Unsatisfactory completion of laboratory or lecture of the course will constitute unsatisfactory grade of the course. * 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 requiring the full duration and fulfillment of all requirements of the lecture and laboratory sections of the course. Failure to satisfactorily complete a repeated RESD course will be considered a failure to maintain satisfactory progress in the major and will result in dismissal from the major.
* Special circumstances like COVID-19 may offer additional grading solutions which the program will comply with

NYCCT LETTER GRADE 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

EVALUATION CRITERIA FOR LUNDEEN WAX-UP AND P.K. THOMAS WAX-UP

Centric Stops (see lab manual) (20 pts.) _____

- maxillary stops 10 pts.
- mandibular stops 10 pts.

Cusp alignment (in Class I) (15 pts.) _____

- in relation to arch 10 pts.
- in relation to occlusal surface 10 pts.

Correct Interdigitation (in Class I) (15 pts.) _____

- in centric occlusion 5 pts.
- in working and balancing 10 pts.

Occlusal Anatomy & Contour (40 pts.) _____
(including all ridges, fossas, pits, primary and secondary grooves)

- Mesial & Distal contacts – 5
- Buccal & Lingual surfaces matching adjacent teeth – 10
- Mesial & Distal marginal ridges – 5
- Triangular Ridges – 10
- Primary & Secondary grooves – 5
- Gingival Embrasures (buccal, lingual, occlusal and cervical) – 5

Finished surfaces (Smooth & Polished) (5 pts.) _____

- smooth surfaces, no excess wax, over-extended wax-up 5 pts.

Cleanliness of Work Area (5 pts.) _____

- Work area and Equipment (2.5)
- Adherence to proper safety procedures (2.5) _____

TOTAL 100

RESD_2310 LECTURE ASSESSMENT CRITERIA Lecture 40% of total course grade

Quiz 20 %
Midterm 40 %
Final 40 %

*TOTAL – LECTURE 100%

OPTIONAL: _____%
extra credit

* Student must achieve a passing grade of at least 70% in the lecture section to pass the class

RESD 2310 LAB ASSESSMENT CRITERIA Laboratory Projects 60% of total course grade

Project 1 name Six prepared mandibular teeth to be waxed against a full maxillary counter33.%
Project 2 name Six prepared maxillary teeth to be waxed against a full mandibular counter-33.%
Project 3 name Twelve maxillary against mandibular fully prepared teeth 34%

*TOTAL – LAB 100%

* Student must achieve a passing grade of at least 70% in the lab section to pass the class

RESD 2310 LECTURE SCHEDULE
(Tentative Schedule, subject to change)

Lecture	Topic	Reading Assignment
1	Topic: Intro and PKT Theory	Reading/Project/Assessment, etc.: Due Date:
2	Topic: Function and Structures	Reading/Project/Assessment, etc.: Due Date:
3	Topic: Development of teeth	Reading/Project/Assessment, etc.: Due Date:
4	lecture and quiz (20%) ******* Topic: Quiz and bones of the face	Reading/Project/Assessment, etc.: Due Date:
5	Topic: Bones of the skull	Reading/Project/Assessment, etc.: Due Date:
6	Topic: Muscles of Facial Expression	Reading/Project/Assessment, etc.: Due Date:
7	Topic: Muscles of mastication	Reading/Project/Assessment, etc.: Due Date:
8	Topic: MIDTERM EXAM (40%)**********	Reading/Project/Assessment, etc.: Due Date:
9	Topic: Anatomy of the TMJ	Reading/Project/Assessment, etc.: Due Date:
10	Topic: Mandibular Movements	Reading/Project/Assessment, etc.: Due Date:
11	Topic: Analysis of Occlusion	Reading/Project/Assessment, etc.: Due Date:
12	Topic: Compensating curves	Reading/Project/Assessment, etc.: Due Date:
13	Topic: Working and Balancing movements	Reading/Project/Assessment, etc.: Due Date:
14	Topic: Class 1,2 and 3 and malocclusion	Reading/Project/Assessment, etc.: Due Date:
15	FINAL (40%)********** Proctored by Instructor	Reading/Project/Assessment, etc.: Due Date:

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4. **Identify** the mandibular movements, including classification areas of rotation, types of motion, side shift and timing
5. **Identify** the nomenclature and theory inherent in occlusion
7. **Identify** the occlusal determinants including horizontal plane records and vertical dimensions
8. **Demonstrate** theoretical and practical knowledge of gnathological dentistry
9. **Develop the ability** to construct a maxillary and mandibular quadrant in cusp to marginal ridge occlusion
10. **Develop the ability** to construct a right and left maxillary and mandibular quadrant in cusp to fossa occlusion
11. **Identify** all centric stops for cusp-marginal ridge occlusion and cusp to fossa occlusion

GENERAL EDUCATION LEARNING OUTCOMES:

4. **Knowledge**:
   - develop broad based knowledge form a range of sources
   - continue building on the knowledge acquired in previous courses - develop ability to deepen and continue learning
5. **Skill**:
   - develop comprehension and proficiency needed for communication, inquiry, analysis, and productive work
6. **Values, Ethics and Relationships**:
   - Professional/Personal development: demonstrate intellectual honesty and personal responsibility
   - Ethics/Values: transform information into knowledge, and knowledge into judgment and action

ASSESSMENT:

To evaluate student achievement of the learning outcomes the professor will do the following:

6. **Assess** students use of professional vocabulary through testing and project completion
7. **Review** students abilities to follow instructions into the laboratory work by means of frequent lab project evaluations
8. **Conduct** multiple choice exams
9. **Evaluate** all exams and projects with emphasis on student's ability to communicate and use of professional vocabulary

LEARNING OUTCOMES FOR RESD 2310:

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

1. **Demonstrate** knowledge concerning the features and operations of semi-adjustable articulator
2. **Identify** the functions of the muscles of mastication including origins and insertions
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5. **Identify** the nomenclature and theory inherent in occlusion
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10. **Develop the ability** to construct a right and left maxillary and mandibular quadrant in cusp to fossa occlusion
11. **Identify** all centric stops for cusp-marginal ridge occlusion and cusp to fossa occlusion

GENERAL EDUCATION LEARNING OUTCOMES:

7. **Knowledge**:
   - develop broad based knowledge form a range of sources
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8. **Skill**:
   - develop comprehension and proficiency needed for communication, inquiry, analysis, and productive work
9. **Values, Ethics and Relationships**:
   - Professional/Personal development: demonstrate intellectual honesty and personal responsibility
   - Ethics/Values: transform information into knowledge, and knowledge into judgment and action

ASSESSMENT:

To evaluate student achievement of the learning outcomes the professor will do the following:

10. **Assess** students use of professional vocabulary through testing and project completion
11. **Review** students abilities to follow instructions into the laboratory work by means of frequent lab project evaluations
12. **Conduct** multiple choice exams
13. **Evaluate** all exams and projects with emphasis on student's ability to communicate and use of professional vocabulary

LEARNING OUTCOMES FOR RESD 2310:

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

1. **Demonstrate** knowledge concerning the features and operations of semi-adjustable articulator
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4. **Identify** the mandibular movements, including classification areas of rotation, types of motion, side shift and timing

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9. **Develop the ability** to construct a maxillary and mandibular quadrant in cusp to marginal ridge occlusion 10. **Develop the ability** to construct a right and left maxillary and mandibular quadrant in cusp to fossa occlusion
11. **Identify** all centric stops for cusp-marginal ridge occlusion and cusp to fossa occlusion

GENERAL EDUCATION LEARNING OUTCOMES:

10. **Knowledge**:
    - develop broad based knowledge form a range of sources
    - continue building on the knowledge acquired in previous courses - develop ability to deepen and continue learning
11. **Skill**:
    - develop comprehension and proficiency needed for communication, inquiry, analysis, and productive work
12. **Values, Ethics and Relationships**:
    - Professional/Personal development: demonstrate intellectual honesty and personal responsibility
    - Ethics/Values: transform information into knowledge, and knowledge into judgment and action

ASSESSMENT:

To evaluate student achievement of the learning outcomes the professor will do the following:

14. **Assess** students use of professional vocabulary through testing and project completion
15. **Review** students abilities to follow instructions into the laboratory work by means of frequent lab project evaluations
16. **Conduct** multiple choice exams
17. **Evaluate** all exams and projects with emphasis on student's ability to communicate and use of professional vocabulary

RESD 2310 PRINCIPLES OF OCCLUSION

COURSE OUTLINE (LABORATORY EXERCISES)

1st Session Lundeen models poured

2nd Session Three sets of Models articulated on semi-adjustable articulator (full Maxillary against prepared mandibular is the case #1)

3rd Session	Wax-up of cusp cones (white wax)
4th Session	Wax-up of buccal and lingual contours (red wax) Wax-up of mesial and distal contour of cusps (green wax)
5th Session	Wax-up of mesial and distal marginal ridges (blue wax)
6th Session	Wax-up of triangular ridges (red wax) and refine secondary anatomy and evaluation of project #1 by the completion of the 6th session
7th Session	Models articulated (prepped maxillary against full mandibular and place cusp cones.)
8th Session	Wax buccal and lingual contours, was mesial and distal marginal ridges
9th Session	Wax triangular and transverse ridges and refine all secondary anatomy
10th Session	Prepared maxillary and mandibular models articulated on a semiadjustable articulator Wax-up of cusp cones (ivory wax) and buccal and lingual contours of cusps (red wax)
11th & 12th Session	Wax-up of mesial and distal contours of cusps (green wax) Wax-up of mesial and distal marginal ridges (blue wax)
13th & 14th Session	Wax-up of triangular and oblique ridges (red wax) Wax-up of triangular and oblique ridges continued
15th Session	Refine all developmental grooves then Project completed and handed in for evaluation by the completion of the 15th session

RESD 2310 - PRINCIPLES OF OCCLUSION COURSE OUTLINE (LECTURE PORTION)

I. INTRODUCTION TO COURSE - ONE LECTURE HOUR

A. General Principles Cusp to Fossa/Cusp to Marginal Ridge Articulations (Theory of P.K.Thomas/Everett - Payne/Lundeen)

B. Review of Anatomy of Maxillary/Mandibular teeth - Wheeler Chapt. I, Air Force Vol. I, p. 82-107

II. THE MAXILLO-FACIAL STRUCTURE - TWO LECTURE HOURS

A. Functions of the Maxillo-Facial Structure - Wheeler, Chapt. IV., pp. 80-88

B. Growth and Development of the Oral Cavity

1. Phylogeny - Ancestral Stages - Ibid, Chapt. IV., pp. 87-92.
2. Child to Adult - Ibid., Chapt. III, pp. 43-79

C. Blood Vessels of the Maxilla and Mandible

III. QUIZ - DURING 4TH LECTURE SESSION **********

IV. BONES OF THE MAXILLAE AND MANDIBLE - ONE LECTURE HOUR - Ibid, Chapt. XIV, pp. 352-378, Air Force Manual, p. 58-66

A. The Maxillae - Form and Structure

B. The Mandible - Form and Structure

V. THE MUSCLES OF THE SKULL - THREE LECTURE HOURS - Ibid, Chapt. XV., pp. 386-393, Air Force Manual, p. 67-78

A. Muscles of Mastication
1. form and structure
2. actions

B. Muscle of facial expression
2. actions

VI. MIDTERM EXAMINATION DURING 8TH SESSION - 1 HOUR******** VII. PRINCIPLE OF MANDIBULAR MOVEMENT - THREE LECTURE HOURS - Ibid., Chapt. XV, pp. 394-404, Air Force Manual, p. 80-81

A. Structure of the tempero-mandibular joint - Ash and Ramfjord, Chapt. I.
B. Analysis of mandibular movement
C. Theory of levers
D. The T.M.J. as the fulcrum of a lever (Air Force Manual, p. 117-118)
E. Principles of physics
F. Application of these principles to mandibular movement
G. Symmetrical movement of the mandibular (Air Force Manual, p. 119-124)
    1. rest positions
    2. depression/elevation
    3. protrusion/retrusion
    4. centric stops
H. Asymmetrical movements of the mandible
    1. lateral excursions

VIII. ANALYSIS OF OCCLUSION - THREE LECTURE HOURS- Ashand Ramfjord, Chapt. X, Air Force Manual p. 108-125, 126-141

A. Requirements of occlusion - Wheeler, Chapt. XVI, pp. 405-422
    1. General and special problems of occlusion
    2. Anatomic and non-anatomic teeth
B. Centric relation and centric occlusion - Ibid, pp. 423-464, (Air Force Manual 113, 135)
C. Curved occlusal planes
D. Occlusal contact of teeth - Ibid., pp. 465-ff, (Air Force Manual p. 115, 138, 139)
    1. in centric occlusion
    2. in lateral excursions
    3. balancing contacts
    4. protrusive/retrusive occlusal relationship
    5. disclusions
E. Slide presentation on achieving bilateral occlusion
    1. describing cusp to fossa occlusion
    2. describing group function type of occlusion
    3. remount procedure showing face-bow transfer - type of models - split cast
F. Slide presentation on grinding bilateral occlusion
    1. describing cusp to fossa occlusion
    2. describing group function occlusion
    3. remount procedure
        a. face bow transfer
        b. mounting of master models
        c. split cast upper model to check centric

IX. FINAL EXAMINATION DURING FINAL CLASS SESSION - 1 HOUR.

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

INSTRUCTIONAL OBJECTIVES PRINCIPLES OF OCCLUSION - RESD 2310 - LECTURE

I. INTRODUCTION TO COURSE - ONE LECTURE HOUR

A. CONDITIONS: Given lectures, slide projector demonstrations and outside readings on H.C. Lundeen and P.K. Thomas approaches to occlusal determination

B. PERFORMANCE: The student should be able to:
1. show all centric stops to cusp-marginal ridge occlusion and cusp-fossa occlusion
2. distinguish between the basic theories of Dr. P.K. Thomas

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

II. MAXILLO-FACIAL STRUCTURE - ONE LECTURE HOUR

1. FUNCTION OF THE MAXILLO-FACIAL STRUCTURE – ONE LECTURE HOUR

A. CONDITIONS: Given a lecture and slide projector demonstration

B. PERFORMANCE: The student should be able to list and define the four primary functions of the maxillo-facial structure connected with the oral cavity

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

2. GROWTH AND DEVELOPMENT OF THE ORAL CAVITY - ONE LECTURE HOUR

A. CONDITIONS: Given a series of lectures and slide projection demonstrations

B. PERFORMANCE:
1.The student should also be able to describe in detail the Phylogeny of human development as it relates to the development of the oral cavity, as well as the stages of growth and development from child to adult
2. The student should be able to describe and locate the Blood vessels of the maxilla and mandible

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

III. QUIZ - DURING 4TH LECTURE SESSION

IV. SKELETAL SYSTEM - TWO LECTURE HOURS

A. CONDITION — Given a series of lectures, slide projector demonstrations and outside readings

B. PERFORMANCE: — The student should be able to:

1. List, identify and locate the areas of the skull which mark the limit of involvement of the dental technician, as well as those which are areas of general concern
2. List, identify, locate and describe the landmark, the body and the processes of the maxillae
3. List, identify, locate and describe the landmarks, the body and the processes of the mandible

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

V. MUSCULAR SYSTEM - THREE LECTURE HOURS

A. CONDITIONS: Given a series of lectures, slide projector demonstrations, and assigned readings

B. PERFORMANCE:

1. List, identify, locate and describe the form, position, action, origin and insertion of:
   a. the muscles of mastication
   b. the muscles of facial expression
2. List, identify, locate and describe:
   a. the bony structure of the temporomandibular joint
   b. the actions of the temporomandibular joint
   c. the muscles, bones and ligaments that work in unison or as antagonists

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

VI. MIDTERM EXAM - ONE LECTURE HOUR**********

VII. PRINCIPLES OF MANDIBULAR MOVEMENT - THREE LECTURE HOURS

A. CONDITIONS: Given a series of lectures, slide projector demonstrations and assigned readings

B. PERFORMANCE: The student should be able to:

1. Define and explain the theory of levers and its relation to the temporomandibular joint\
2. Define and explain basic principles of physics which apply to dental technology, including, but not limited to, kinetics, inclined planes, adhesion, and cohesion
3. Define, list and explain symmetrical and asymmetrical movements of the mandible, physiologic rest positions, and centric relation
4. Identify the mandibular movements including the classification, axis of rotation, types of motion, side shift and timing
5. List and describe the objectives of the doctor's treatment, and the role of the technician in helping the doctor to meet those objectives

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

VIII. ANALYSIS OF OCCLUSION - TWO LECTURE HOURS

A. CONDITIONS: Given a series of lectures, slide projector demonstrations, and assigned reading

B. PERFORMANCE: The student should be able to list, define and explain:

1. The nomenclature of occlusion
2. The theory inherent in occlusion
3. The occlusal determinants including horizontal plane records and vertical dimension
4. Centric occlusion and centric relation
5. Curved occlusal planes (Curve of Spee, Curve of Wilson and Monson Sphere)
6. Bonwill triangle
7. Occlusal contact of each tooth with its antagonist in the opposing arch during centric occlusion and lateral excursions
8. The importance of the maintenance of vertical dimension

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

IX. FINAL EXAMINATION DURING FINAL CLASS SESSION - ONE HOUR

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

INSTRUCTIONAL OBJECTIVES PRINCIPLES OF OCCLUSION - RESD 2310 - LABORATORY SECTION

I. PREPARING P.K. THOMAS AND W.C. LUNDEEN CASTS - ONE LABORATORY SESSION

A. CONDITIONS: Given a demonstration of technique by the instructor

B. PERFORMANCE: The student should be able to pour casts for cuspmarginal ridge and for cusp-fossa occlusion

C. EXTENT & CRITERIA: Models should be totally free from bubbles or voids and correctly prepared with 100% accuracy at the end of one session

II. ARTICULATION OF FULL UPPER AGAINST A PREPARED LOWER MODEL - ONE LABORATORY SESSION

A. CONDITIONS: Given a demonstration of technique by the instructor

B. PERFORMANCE: The student should be able to able to articulate the maxillary and mandibular models

C. EXTENT & CRITERIA: The models should be articulated for wax-added technique with 100% accuracy at the end of one session.

III. BUILD-UP BUCCAL AND LINGUAL CUSP CONES - ONE LABORATORY SESSION

A. CONDITIONS: Using articulated Lundeen models for cusp marginal ridge occlusion and given a demonstration by the instructor with visual illustrations

B. PERFORMANCE: The student should be able to wax mandibular buccal cusp tips in prescribed position for Lundeen's technique

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

V. CONTINUATION OF BUCCAL AND LINGUAL DEVELOPMENT - ONE LABORATORY SESSION

A. CONDITIONS: Given a demonstration by the instructor

B. PERFORMANCE: The student should be able to build-up in wax the buccal and lingual ridge of the mandibular buccal tips

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

V. MESIAL AND DISTAL DEVELOPMENT - ONE LABORATORY SESSION

A. CONDITIONS: Given a demonstration by the instructor

B. PERFORMANCE: The student should be able to build up in wax the mandibular mesial and distal cusp ridges to the correct anatomical contour

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

VI. MARGINAL RIDGE DEVELOPMENT - ONE LABORATORY SESSION

A. CONDITIONS: Given a demonstration by the instructor and visual illustrations

B. PERFORMANCE: The student should be able to build up in wax the mandibular triangular ridges and establish the primary and secondary marginal ridges and the mesial and distal pits in their correct location with all developmental grooves completing the occlusal surface

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

VIII. ARTICULATION OF PREPARED UPPER AND LOWER MODELS – ONE LAB SESSION

A. CONDITIONS: Given a demonstration by the instructor and visual illustrations

B. PERFORMANCE: The student should be able to articulate the maxillary and mandibular models

C. EXTENT & CRITERIA: The models should be articulated for wax-added technique with 100% accuracy at the end of one session.

IX. MAXILLARY AND MANDIBULAR CUSP TIPS - ONE LABORATORY SESSION

A. CONDITIONS: Using articulated P.K. Thomas models for cusp to fossa occlusion and given a demonstration by the instructor and visual illustrations

B. PERFORMANCE: The student should be able to wax mandibular and maxillary buccal cusp tips in prescribed position for Lundeen's technique

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

X. CONTINUATION OF BUCCAL AND LINGUAL DEVELOPMENT - ONE LABORATORY SESSION

A. CONDITIONS: Given a demonstration by the instructor

B. PERFORMANCE: The student should be able to build-up in wax the buccal and lingual ridge of the mandibular and maxillary buccal tips

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

XII. MARGINAL RIDGE DEVELOPMENT - ONE LABORATORY SESSION

A. CONDITIONS: Given a demonstration by the instructor and visual demonstrations

B. PERFORMANCE: The student should be able to build up in wax the mesial and distal marginal ridges of the maxillary and mandibular posterior teeth

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

XIII. TRIANGULAR AND OBLIQUE RIDGES - THREE LABORATORY SESSIONS

A. CONDITIONS: Given a demonstration by the instructor and using visual illustrations

B. PERFORMANCE: The student should be able to wax the triangular and oblique ridges of the maxillary and mandibular cusp to fossa occlusion with all developmental grooves completing occlusal surfaces

C. EXTENT & CRITERIA: With at least 70% accuracy at the end of three laboratory sessions.

*** XIV. ALL PROJECTS COMPLETED AND SUBMITTED FOR EVALUATION BY THE COMPLETION OF THE 15TH SESSION
EVALUATION CRITERIA FOR LUNDEEN WAX-UP AND P.K. THOMAS WAX-UP

Centric Stops (see lab manual) (20 pts.) _____
- maxillary stops 10 pts.
- mandibular stops 10 pts.

Cusp alignment (in Class I) (15 pts.) _____
- in relation to arch 10 pts.
- in relation to occlusal surface 10 pts.

Correct Interdigitation (in Class I) (15 pts.) _____
- in centric occlusion 5 pts.
- in working and balancing 10 pts.

Occlusal Anatomy & Contour (40 pts.) _____
(including all ridges, fossas, pits, primary and secondary grooves)
- Mesial & Distal contacts – 5
- Buccal & Lingual surfaces matching adjacent teeth – 10
- Mesial & Distal marginal ridges – 5
- Triangular Ridges – 10
- Primary & Secondary grooves – 5
- Gingival Embrasures (buccal, lingual, occlusal and cervical) – 5

Finished surfaces (Smooth & Polished) (5 pts.) _____
- smooth surfaces, no excess wax, over-extended wax-up 5 pts.

Cleanliness of Work Area (5 pts.) _____
- Work area and Equipment (2.5)
- Adherence to proper safety procedures (2.5)

_____

TOTAL 100

LEARNING OUTCOMES FOR RESD 2310:
Upon successful completion of the course each student will be able to:

1. **Demonstrate** knowledge concerning the features and operations of semi-adjustable articulator
2. **Identify** the functions of the muscles of mastication including origins and insertions
3. **Identify** the anatomy and function of the temporomandibular joint, including ligaments
4. **Identify** the mandibular movements, including classification areas of rotation, types of motion, side shift and timing
5. **Identify** the nomenclature and theory inherent in occlusion 7. **Identify** the occlusal determinants including horizontal plane records and vertical dimensions
8. **Demonstrate** theoretical and practical knowledge of gnathological dentistry
9. **Develop the ability** to construct a maxillary and mandibular quadrant in cusp to marginal ridge occlusion
10. **Develop the ability** to construct a right and left maxillary and mandibular quadrant in cusp to fossa occlusion
11. **Identify** all centric stops for cusp-marginal ridge occlusion and cusp to fossa occlusion

GENERAL EDUCATION LEARNING OUTCOMES:

13. **Knowledge**:
    - develop broad based knowledge form a range of sources
    - continue building on the knowledge acquired in previous courses - develop ability to deepen and continue learning
14. **Skill**:
    - develop comprehension and proficiency needed for communication, inquiry, analysis, and productive work
15. **Values, Ethics and Relationships**:
    - Professional/Personal development: demonstrate intellectual honesty and personal responsibility
    - Ethics/Values: transform information into knowledge, and knowledge into judgment and action

ASSESSMENT:

To evaluate student achievement of the learning outcomes the professor will do the following:

18. **Assess** students use of professional vocabulary through testing and project completion
19. **Review** students abilities to follow instructions into the laboratory work by means of frequent lab project evaluations
20. **Conduct** multiple choice exams
21. **Evaluate** all exams and projects with emphasis on student's ability to communicate and use of professional vocabulary

LEARNING OUTCOMES FOR RESD 2310:
Upon successful completion of the course each student will be able to:

1. **Demonstrate** knowledge concerning the features and operations of semi-adjustable articulator

2. **Identify** the functions of the muscles of mastication including origins and insertions
3. **Identify** the anatomy and function of the temporomandibular joint, including ligaments
4. **Identify** the mandibular movements, including classification areas of rotation, types of motion, side shift and timing
5. **Identify** the nomenclature and theory inherent in occlusion 7. **Identify** the occlusal determinants including horizontal plane records and vertical dimensions
8. **Demonstrate** theoretical and practical knowledge of gnathological dentistry
9. **Develop the ability** to construct a maxillary and mandibular quadrant in cusp to marginal ridge occlusion
10. **Develop the ability** to construct a right and left maxillary and mandibular quadrant in cusp to fossa occlusion
11. **Identify** all centric stops for cusp-marginal ridge occlusion and cusp to fossa occlusion

GENERAL EDUCATION LEARNING OUTCOMES:

16. **Knowledge**:
    - develop broad based knowledge form a range of sources
    - continue building on the knowledge acquired in previous courses
    - develop ability to deepen and continue learning
17. **Skill**:
    - develop comprehension and proficiency needed for communication, inquiry, analysis, and productive work
18. **Values, Ethics and Relationships**:
    - Professional/Personal development: demonstrate intellectual honesty and personal responsibility
    - Ethics/Values: transform information into knowledge, and knowledge into judgment and action

ASSESSMENT:

To evaluate student achievement of the learning outcomes the professor will do the following:

22. **Assess** students use of professional vocabulary through testing and project completion
23. **Review** students abilities to follow instructions into the laboratory work by means of frequent lab project evaluations
24. **Conduct** multiple choice exams
25. **Evaluate** all exams and projects with emphasis on student's ability to communicate and use of professional vocabulary

RESD2310 LABORATORY COURSE OUTLINE

In all laboratory sessions the student will be required to bring:

1. Bunsen burner and or *No Flame* unit
2. Instruments (PKT #1 & #2, Zahle/Roach carver, Murphy's knife, ….)
3. Flexible millimeter ruler
4. Red-blue pencil, regular pencil, permanent marker (black or blue)
5. Mixing bowl and spatula
6. PPE equipment: lab coat, goggles, mask

7. Place mat (clear or gray)
8. Laboratory manual :TOOTH TO TOOTH OCCLUSION