

Orthodontics (Ort) #910

Orthodontic Technique Lab Course

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Purpose:

The Orthodontic Technique Lab Course is the introductory level for the first year orthodontic resident. It is designed to develop technical skills necessary for clinical and laboratory procedures. Also, this course provides knowledge of laboratory devices that can be used in conjunction with fixed orthodontic mechanics.

Assignments & Goals:

- **Introductory Session** – Designed to introduce first year residents to orthodontic appliances and tour a local commercial laboratory (Great Lakes Orthodontics Ltd. 200 Cooper Ave, Tonawanda, NY 14150). **Goals** – Understand lab fabrication procedures and importance of information sent for appliance construction.
- **Orthodontic Study Models** – Students are introduced to the clinic and guided through impression taking techniques. Each student requires two high-quality impressions. One of the impressions is to be used for fabrication of an orthodontic study model that meets ABO standards. The second impression is will be facebow mounted to a SAM articulator. Digital models, such as Cadent (OrthoCad) or GeoDigm (emodel) will be reviewed. **Goals** – Identify proper impression taking techniques, study model construction procedures, and become familiar with model imaging programs.
- **Laboratory Wirebending Exercises** – Overview of wires and pliers used in the field will take place. Then four drawn pattern designs to initially teach students proper wirebending techniques will be reviewed. Primarily three lab pliers are used; three prongs, #134 or bird beak, and Jarabak pliers. Students are required to recreate paper pattern forms that meet high standards of the instructor. Next, pegboard/stone model exercises are used to train the resident wire adaptation along a three-dimensional form. Students are required to recreate pattern forms that meet high standards of instructor.

The last lab exercise involves scalloping a 14” length of 0.028” diameter stainless steel wire along the facial gingival margins around the entire arch of a model. Students are required to complete one scalloped wire contour to high standards of the instructor. **Goals** – Become familiar with instruments and materials, improve manual dexterity skills, and understand proper wirebending techniques using round wire.

- **Utility Arch Wirebending Exercises** – Square or rectangular wire is used to recreate common utility arch paper patterns. Students are required to recreate pattern forms that meet high standards of the instructor. **Goals** - Become familiar with instruments and materials, improve manual dexterity skills, and understand proper wirebending techniques using square or rectangular wire.
- **Indirect Bonding Trays** – Students are instructed to place brackets on upper and lower casts. A dual Biostar tray system will be made over both arches. Clinical procedure involving the indirect bonding technique will be reviewed. **Goals** – Learn array of bracket designs, bracket positioning for each tooth, fabrication of state-of-the-art transfer tray design, and discuss clinical process of indirect bonding.
- **Retainers & Active Plates** – Detailed instruction of appliance designs, maintenance, and components will be reviewed. Hands-on guidance of wire clasps, labial bows, springs, screw placement, acrylic procedures, trimming and finishing will take place. All students will complete the following appliances:
 - Invisible/Essix Retainer with tooth resets.
 - Acrylic Plate Exercise (“salt-&-pepper”/Biostar).
 - Ricketts Bow Plate w/ Central Incisor Pontic and Arrow Clasps.
 - Wraparound Retainer w/S-Z Springs.
 - ACCO/Cetlin Molar Distalizer & clasping
 - Upper Soldered Bow to C-Clasps W/Anterior Finger Springs.
 - Maxillary Schwarz Plate.
 - Mandibular Schwarz Plate.

Goals – Learn array of removable plate designs available, fabrication procedures, how they are adjusted, and treatment management of devices.

- **Orthodontic Soldering Exercises** – A review of soldering materials will occur. Then students are required to complete five paper pattern exercises. Completion of all exercises is based on high quality standards of instructor. Then optional participation of miscellaneous soldered auxiliaries used for removable plates are:

 - Soldered Finger Spring to Labial Bow.
 - Lingual Push Springs to Labial Bow.
 - Elastic Hooks on Labial Bow.
 - C-Clasp to Hawley Labial Bow.
 - Labial Bow Soldered to Adams Clasp.
 - Labial Bow Soldered to C-Clasps (required for active plate).

Goals – Become familiar with instruments, equipment and materials, improve manual dexterity skills, and understand proper soldering techniques.

- **Soldered/Fixed Appliances** – An array of fixed orthodontic lab appliances will be reviewed as well as required student hand-on fabrication of:

 - Mandibular 3x3 Bonded Lingual Retainer.
 - Removable Transpalatal Arch (TPA).
 - Quadhelix Expander.
 - Molar Distalizing Appliance – ½ Pendulum, ½ Distal Jet.
 - Haas RME
 - Hygienic RME (to be included w/cantilever Herbst).

Goals – Learn proper band placement techniques, become familiar with commonly used fixed lab appliances, and understand fabrication procedures.

- **Functional Jaw Orthopedic Devices** – Many lab appliances may be used to treat Class II and Class III malocclusions. These appliances will be discussed as well as hands-on fabrication of a Cantilever Herbst appliance to instructor’s standards is required by students.

Goals – Become familiar with array of appliances used for treatment of these malocclusions, construction bite technique and the fabrication process of a Cantilever Herbst appliance.

- **Tooth Positioners** – Tooth Positioners and Elastodontic appliances will be reviewed. Fabrication of a diagnostic set-up will take place following gnathologic standards. **Goals** – Understand state-of-the-art

gnathologic tooth positioning concepts and diagnostic set-up requirements for appliance fabrication. Also, they will learn the array of appliance designs.

- **Gnathologic Articulator Mounting & Occlusal Splint** – Facebow and CR bite records will be taken by each student and mounted to the SAM articulator. An overview of commonly used occlusal splint appliances will be reviewed. Students are required to fabricate a flat plane, soft or hard splint. **Goals** – Ability to work with gnathologic articulator system, learn CR and CO bite registration techniques, variety and use of occlusal splints, and fabrication process of flat plane design.
- **Athletic Mouthguards** – Discussion of pressure laminated mouthguard designs will be reviewed. Students are required to fabricate dual laminate mouthguard over orthodontic brackets. **Goals** – Learn variety of designs and fabrication procedures using pressure-molding machines.

Evaluation/Grading Process:

Projects are categorized by exercise type or appliance design (see **Orthodontic Lab Course – Assignment Grading Form**). The categorized projects are subdivided into parts that will be evaluated and graded by the instructor. The average of the graded parts will represent that project grade. The final grade is determined by the average of all projects.

Grades are as follows for subdivided parts of each project: A = 4pts, B = 3pts, C = 2pts, D = 1pt, F = 0. Final grade point average is: A = 4.0-3.75, A- = <3.75-3.5, B+ = <3.5-3.15, B = <3.15-2.85, B- = <2.85-2.5, C+ = <2.5-2.15, C = <2.15-1.85, C- = <1.85-1.5, D = <1.5-0.75, F = <0.75-0.

Orthodontic Technique Lab Course

Assignment Grading Form

Student Name:

Date:

Total Points =

Final Grade:

Diagnostic Study Model (2 Sets Impressions Needed)

<i>Model Pour</i>	<i>Level Base</i>	<i>Heels To Bite</i>	<i>Base Angle & Length</i>	<i>Carve Quality</i>	<i>Plaster Finish</i>	<i>Project Grade</i>

Wirebending Exercises (4 – Paper Forms)

<i>Assignment</i>	<i>(A)</i>	<i>(B)</i>	<i>(C)</i>	<i>(D)</i>	<i>Project Grade</i>
Exercise – 1				-----	
Exercise – 2					
Exercise – 3				-----	
Exercise – 4					
Pegboard			----- -	-----	
Utility arch				SW-	

Project Grade

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Removable Plates

Lower Invisible Retainer (Model #1L)

<i>Tooth Reset</i>	<i>Thermal Form</i>	<i>Trim & Finish</i>	<i>Project Grade</i>

Project Grade

Maxillary Acrylic Plate Exercise (Model #6)

	<i>Acrylic</i>	<i>Trim</i>	<i>Finish</i>	<i>Project Grade</i>
Standard Cold-cure				
Biostar Plate				

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Maxillary Schwarz Plate (Model #3U)

<i>Hawley Labial Bow</i>	<i>Wire Clasps</i>	<i>Overlap Springs</i>	<i>Expansion Screw</i>	<i>Acrylic & Trim</i>	<i>Finish</i>	<i>Project Grade</i>

Mandibular Schwarz Plate (Model #3L)

<i>Hawley Labial Bow</i>	<i>Wire Clasps</i>	<i>Expansion Screw</i>	<i>Acrylic & Trim</i>	<i>Finish</i>	<i>Project Grade</i>

Wraparound Retainer (Model #1U)

<i>Labial Bow</i>	<i>Anterior S/Z Springs</i>	<i>Acrylic Trim</i>	<i>Finish</i>	<i>Project Grade</i>

Maxillary Finger Spring Plate (Model #10)

<i>Labial Bow</i>	<i>Solder Joint</i>	<i>Wire Clasps</i>	<i>Finger Springs</i>	<i>Acrylic Trim</i>	<i>Finish</i>	<i>Project Grade</i>

Maxillary Ricketts Plate with Pontic (Model #4)

<i>Ricketts Labial Bow</i>	<i>Wire Clasps</i>	<i>Pontic</i>	<i>Acrylic Trim</i>	<i>Finish</i>	<i>Project Grade</i>

ACCO/Cetlin Plate (Model #11)

<i>Acrylic Labial Bow</i>	<i>Wire Clasps</i>	<i>Molar Spring</i>	<i>Sagittal Screw</i>	<i>Acrylic Trim</i>	<i>Finish</i>	<i>Project Grade</i>

Indirect Bonding (Models #5U & L)

Tray Design	Bracket Placement	Tray Form & Trim	Finish	Project Grade
Upper Tray				
Lower Tray				

Orthodontic Soldering & Lab Appliances

Soldering Exercises

*Soldering
Exercise
Grade*

	(A)	(B)	(C)	(D)	Project Grade
Exercise #1				-----	
Exercise #2					
Exercise #3				-----	
Exercise #4				-----	
Solder 3-in-1 Exercise					Yes ----- No

Removable Transpalatal Arch (TPA) – (Model #5U)

Band Placement	Wire framework	Lingual Sheath	Finish	Project Grade

Quadhelix (Model #3U)

Band Placement	Wire Framework	Soldering	Finish	Project Grade

Haas RME (Model #7U)

Band Placement	Wire Framework	Soldering	Finish	Project Grade

Molar Distalizer – 1/2 Distal Jet/ 1/2 Pendulum (Model #2)

Bands	Nance Wire	Pendulum Spring	DJ Hardware	Acrylic & Trim	Finish	Project Grade

Functional Jaw Orthopedics

Cantilever Herbst (Model #9U & L)

Crown Placement	<i>Framework</i>	<i>Solder</i>	<i>Hardware Adaptation</i>	<i>RME Screw</i>	<i>Finish</i>	<i>Project Grade</i>

Occlusal Splint

Maxillary Flat Plane Splint (Student Upper & Lower Model Needed)

Articulator Mounting	<i>Indexing</i>	<i>Acrylicing</i>	<i>Trim</i>	<i>Finish</i>	<i>Project Grade</i>

Sports Mouthguard

Lamination Mouthguard (Model #12)

Pressure Molding	<i>Trim</i>	<i>Finish</i>	<i>Project Grade</i>

Orthodontic Lab Course

Supplied Models & Appliance Designs

Set #1	<p>Upper – Wraparound retainer</p> <ul style="list-style-type: none"> • “S” spring <p>Lower – Invisible retainer</p> <ul style="list-style-type: none"> • Reset two lower incisors
Model #2	<p>Upper – Molar Distalizer</p> <ul style="list-style-type: none"> • Left side – Pendulum Appliance • Right side – Distal Jet • First molar bands (RMO: U21) • First bicuspid bands (RMO: K+)
Set #3.1	<p>Upper – Schwarz plate</p> <ul style="list-style-type: none"> • 3x3 Hawley labial bow. • Ball clasps between bicuspid. • Adams clasps on 1st permanent molars. • 2x2 anterior overlapping springs. • Transverse expansion screw (125-006). <p>Lower – Schwarz plate</p> <ul style="list-style-type: none"> • 3x3 Hawley labial bow. • Ball clasps between bicuspid. • Adams clasps on 1st permanent molars • Transverse expansion screw (125-010)
Set #3.2	<p>Upper – Quadhelix Expander</p> <ul style="list-style-type: none"> • 1st molar bands (RMO: RT-U21/LF-U22)
Set #4	<p>Upper – Ricketts retainer with pontic</p> <ul style="list-style-type: none"> • Ricketts labial bow. • Arrow clasps between bicuspid. • Left central incisor pontic. <p>Lower – 3x3 indirect lingual arch.</p>
Set #5.1	<p>Upper – Silicone indirect bonding tray</p> <p>Lower – Biostar indirect bonding tray</p>

Model # 5.2	Upper – Transpalatal Arch. <ul style="list-style-type: none"> • First molar bands (RMO: RT/LF-U25) • TPA Size 41mm • Lingual Sheaths (2)
Model #6	Upper – Acrylic plate exercise (x2) <ul style="list-style-type: none"> • Biostar plate • S & P plate • Wire scallop
Model #7	Upper – Haas <ul style="list-style-type: none"> • 1st molar bands (RMO: RT/LF-U20) • 1st bicuspid bands (RMO: RT/LF- J) • RME (125-007) • Class III Hooks
Set #9	Upper & Lower Cantilever Herbst Appliance <ul style="list-style-type: none"> • Maxillary Hygienic RME (125-003) • Herbst Hardware (090-050) • Cantilever Bar • 1st molar crowns (ORMCO: #5)
Model #10	Upper – Finger spring plate with soldered labial bow <ul style="list-style-type: none"> • Finger springs to distal of left & right central incisors. • Circumferential clasps on 1st permanent molars. • Ball clasps between bicuspid. • Labial bow soldered to circumferential clasps.
Model #11	Upper - ACCO appliance <ul style="list-style-type: none"> • ACCO labial bow. • Arrow clasps between bicuspid. • Molar spring to right 1st permanent molar. • Molar sagittal screw at left 1st permanent molar (125-008). • Flat anterior bite plate.
Model #12	Upper – Dual Laminate Mouthguard Over Brackets