

**PROSTHODONTICS PROGRAM SYLLABI**

**BUIDRE**

**2008-2009**

## **PR 720: Practice Management**

<b>Course Instructor:</b>	Dr. Maher Atassi
<b>Office Hours:</b>	Sunday – Thursday 9:00am to 4:00 pm
<b>Credit Hours:</b>	1
<b>Prerequisites:</b>	D.M.D., D. D.S. or equivalent
<b>Co-Requisites:</b>	None

**Course Description:** The goal of this course is to review fundamental principles of risk management of a dental practice with special emphasis on record keeping.

**Intended Learning Outcome:** At the completion of this course the student will:

- Know how to develop and implement a total risk management system for a dental office
- Know how to conduct an audit of the risk management system, identify weaknesses and correct them
- Know the importance of keeping meticulous dental records
- Know how to manage completed patients

### **Course Topics and Content:**

- Doctor/patient communication
- Informed consent
- Dismissing the problem patient
- Avoiding malpractice—risk management
- Preventive management
- When treatment is completed—what to do
- The health history
- Necessary contents of a record
- How long to keep records

**Assignments and Due Dates:** Course attendance and participation is required.

**Methods and Dates of Student Evaluations:** Grade is based on attendance and class participation. Students will be given an evaluation form at the end of the course.

**Teaching and Learning Methodologies:** Lecture and discussion format.

### **Course Text, Recommended Reading, Material, and Resources:**

There is no specific assigned reading.

## **PR 801: Fixed Prosthodontics**

<b>Course Instructor:</b>	Dr. Nawaf AlDousari
<b>Office Hours:</b>	Sunday – Thursday 9:00 am to 4:00 pm
<b>Credit Hours:</b>	2
<b>Prerequisites:</b>	D.M.D., D. D.S. or equivalent
<b>Co-Requisites:</b>	None

**Course Description:** This advanced-level course reviews all aspects of fixed prosthodontic therapy with special emphasis on contemporary materials and techniques and the principles of occlusion as they relate to fixed Prosthodontic. The goal of this course is an in-depth review of all aspects of fixed prosthodontic therapy with special emphasis on contemporary materials and techniques.

### **Intended Learning Outcome:**

At the conclusion of this course the student will possess in-depth knowledge of:

- Diagnosis and treatment planning for fixed prosthodontics
- Periodontal considerations in fixed prosthodontics
- Biomechanical principles of tooth preparation for fixed restorations
- Principles and procedures for the fabrication of provisional restorations
- Soft tissue management and impression techniques
- Impression materials and principles of making interocclusal records
- Fitting of castings, cements and cementation
- Implant-supported fixed prostheses
- Biomechanical principles of occlusion
- Implant-supported occlusion for fixed restorations
- The role of the prosthodontist in the management of temporomandibular disorders
- Complete mouth rehabilitation with fixed prosthodontics
- Restoration of endodontically treated teeth to include:
  - The role of the ferrule effect with regard to the prognosis of restored pulpless teeth
  - The ability to evaluate the restorability of a tooth that requires endodontic therapy
  - The various types of prefabricated posts available
  - The mechanical and physical properties of currently available core materials
  - The indications and contraindications of various foundation materials and techniques
  - The biomechanics of restored pulpless teeth
  - Cementing media for posts
  - The role of complete crowns and onlay restorations as protective restorations for posterior pulpless teeth

## **Course Topics and Content:**

- Orientation, diagnosis and treatment planning
- Periodontal considerations in fixed prosthodontics
- Biomechanical principles of tooth preparation
- Provisional restorations
- Soft tissue management and impression techniques
- Impression materials and interocclusal records
- Fitting of castings, cements and cementation
- Implant-supported fixed prostheses—the VA study
- Biomechanical principles of occlusion
- Implant-supported occlusion for fixed restorations
- The role of the prosthodontist in the management of temporomandibular disorders
- Complete mouth rehabilitation with fixed prosthodontics
- Restoration of endodontically treated teeth

**Assignments and Due Dates:** Course attendance and participation is required

**Methods and Dates of Student Evaluations:** There will be a midterm and a final examination. The final examination is cumulative.

The final grade will be determined by calculating an average of the scores on the two examinations.

**Teaching and Learning Methodologies:** Lecture and discussion format

**Course Text, Recommended Reading, Material, and Resources:** TBA

## **PR 803: Complete Denture Prosthodontics**

<b>Course Instructor:</b>	Dr. Nawaf AlDousari
<b>Office Hours:</b>	Sunday – Thursday 9:00 am to 4:00 pm
<b>Credit Hours:</b>	2
<b>Prerequisites:</b>	D.M.D., D. D.S. or equivalent
<b>Co-Requisites:</b>	None

**Course Description:** The goal of this course is to review in-depth contemporary principles and techniques used for the restoration of totally edentulous jaws with complete dentures, including implant-supported overdentures.

**Intended Learning Outcome:** At the conclusion of this course the student will have in-depth knowledge of:

- Diagnosis and treatment planning for the edentulous patient
- Anatomy and physiology of the edentulous mouth
- The special needs of elderly edentulous patients
- Complete denture impression techniques
- Principles and techniques of making jaw relation records
- Complete denture occlusion and methods to arrange artificial teeth
- The wax trial denture, insertion and post insertion care
- Relining and rebasing complete dentures, tissue conditioners
- Implant-supported overdentures
- The Hanau quint
- The maxillary complete denture that occludes with natural teeth
- Immediate dentures
- Processing techniques for complete dentures
- Complete denture esthetics

### **Course Topics and Content:**

- Orientation, diagnosis and treatment planning
- Anatomy and physiology of the edentulous mouth, edentulism and the elderly
- Complete denture impressions
- Jaw relation records
- Complete denture occlusion, arrangement of artificial teeth
- The wax trial denture, insertion and post insertion care
- Relining and rebasing complete dentures, tissue conditioners

- Implant-supported overdentures
- The Hanau quint
- The maxillary complete denture that occludes with natural teeth
- The maxillary complete denture that occludes with fixed prosthodontics
- Immediate dentures
- Processing complete dentures
- Esthetics

**Assignments and Due Dates:** Course attendance and participation is required

**Methods and Dates of Student Evaluations:** There will be a midterm and a final examination. The final examination is cumulative.

The final grade will be determined by calculating an average of the scores on the two examinations.

**Teaching and Learning Methodologies:** Lecture and discussion format

**Course Text, Recommended Reading, Material, and Resources:** TBA

## **PR 805: Esthetic Dentistry for the Prosthodontist**

**Course Instructor:** Dr. Nawaf AlDousari

**Office Hours:** Sunday – Thursday 9:00 am to 4:00 pm

**Credit Hours:** 1

**Prerequisites:** D.M.D., D. D.S. or equivalent

**Co-Requisites:** None

**Course Description:** The goal of this course is a review of the principles of esthetics as they relate to contemporary Prosthodontics.

**Intended Learning Outcome:** At the conclusion of the course, the student will have in-depth knowledge of:

- Materials and methods used to improve the esthetic appearance of patients
- Procedures for restoring teeth with porcelain laminate veneers, inlays and onlays
- All-ceramic complete crowns
- Principles of color and shade selection
- Composite resin bonding
- The interaction of esthetics and function
- Esthetic management of the dentogingival unit
- Tooth whitening
- Esthetic control with implant-supported prostheses.

### **Course Topics and Content:**

- Principles of dental and facial esthetics I
- Principles of dental and facial esthetics II
- Minimally invasive esthetic procedures: Tooth whitening, micro-abrasion, tooth contouring
- Porcelain laminate veneer restorations
- Dental adhesives and esthetic cements
- Anterior and posterior direct composite restorations
- Esthetic inlays and onlays: Ceramic and indirect composite resin restorations
- Contemporary all-ceramic crowns
- Principles of color and shade matching
- Restoration of pulpless teeth: Achieving an optimal esthetic result
- Esthetic fixed partial dentures
- Esthetic control with implant-supported prostheses

**Assignments and Due Dates:** Class attendance and participation are required

**Methods and Dates of Student Evaluations:** There will be a final examination and the grade will be based on the results of this examination.

**Teaching and Learning Methodologies:** lecture and handouts

**Course Text, Recommended Reading, Material, and Resources:** There are no specific texts for this course

## **PR 806: Removable Partial Dentures**

<b>Course Instructor:</b>	Dr. Nawaf AlDousari
<b>Office Hours:</b>	Sunday – Thursday 9:00 am to 4:00 pm
<b>Credit Hours:</b>	2
<b>Prerequisites:</b>	D.M.D., D. D.S. or equivalent
<b>Co-Requisites:</b>	None

**Course Description:** The goal of this advanced-level course is to provide the students with in-depth knowledge related to the treatment of partially edentulous patients with removable partial dentures. Emphasis is placed on diagnosis, treatment planning, and methods of stress control. Students are responsible for all material covered in lectures and in required readings.

### **Intended Learning Outcome:**

At the conclusion of this course, the student will possess in-depth knowledge and skills related to:

- Diagnosis and treatment planning for patients requiring removable partial dentures
- Principles of stress control for RPD
- Surveying and designing RPD frameworks
- Mouth preparations, impression techniques, framework try-in
- Crowned abutments
- Biomechanical principles of occlusion
- Insertion and post-insertion care
- Attachment-retained RPDs
- Relining RPDs
- The combination syndrome
- Laboratory procedures for surveying and designing RPD frameworks and for fabricating crowned abutments for RPDs

### **Course Topics and Content: Topics to be covered in this course include:**

- Components and classification of the removable partial denture (RPD)
- Diagnosis and treatment planning
- Principles of stress control
- Survey of the diagnostic cast and design of the framework
- Mouth preparations
- Impression procedures
- Laboratory procedures for framework fabrication

- Framework try-in and adjustment
- Altered cast technique
- Occlusion
- Processing techniques
- Insertion and post-insertion care
- Relines
- Integrated fixed and removable prosthodontics: crowned abutments
- Attachment-retained RPD's

**Assignments and Due Dates:** See “Learning Unit” outlines below. All reading material assigned in the text and any handout material is considered required reading.

**Methods and Dates of Student Evaluations:** Final grade will be determined by two written examinations, grades for laboratory exercises and attendance at lectures and laboratory sessions. Attendance is mandatory for all sessions.

**Teaching and Learning Methodologies:** This course on removable partial dentures will be a lecture and laboratory technique course.

**Course Text, Recommended Reading, Material, and Resources:**

Required Text: Phoenix RD, Cagna DR, DeFrest CF. Stewart's clinical removable partial prosthodontics, 3rd ed. Quintessence, 2003.

Required Reading: All required reading will be assigned. All required reading will be provided to students or will be taken from the required text.

**Learning unit:** Components and classification of the RPD  
**Course:** Postdoctoral Removable Partial Dentures

**Learning objectives:**

After completion of this learning unit the student should:

1. Be familiar with the Kennedy system of classification of the partially edentulous arch.
2. Understand the various designs and structural and biological requirements of maxillary major connectors.
3. Understand the various designs and structural and biological requirements of mandibular major connectors.
4. Know the various designs of rests and be able to describe their function.
5. Be aware of the role of minor connectors.
6. Understand the various direct retainers (clasp assemblies) and be aware of the functions of a clasp assembly.
7. Be aware of the philosophy of indirect retention and the design of an indirect retainer.
8. Know the functions and design requirements of the denture base.
9. Be familiar with different methods of attachment of artificial teeth to the RPD.

**Learning unit:** Diagnosis and treatment planning  
**Course:** Postdoctoral Removable Partial Dentures

**Learning objectives:**

After completion of this learning unit the student should:

1. Understand the importance of the diagnostic phase of treatment.
2. Be able to integrate information obtained from the clinical examination, patient history, diagnostic casts, and dental radiographs to aid in diagnosis and treatment planning.
3. Have a thorough knowledge of the procedures for making accurate diagnostic impressions and accurate diagnostic casts.
4. Be able to evaluate effectively the existing occlusal relationships.
5. Understand the importance of a harmonious occlusion for the RPD.
6. Appreciate the importance of coordinating other phases of treatment, such as periodontal and restorative dentistry, into the overall treatment plan.
7. Understand the importance of referring the patient to appropriate specialists for advice and treatment when indicated.

**Learning unit:** Principles of stress control  
**Course:** Postdoctoral Removable Partial Dentures

**Learning objectives:**

After completion of this learning unit the student should:

1. Appreciate the importance of stress control and understand that stresses are complex, inevitable, and the result of multi-directional forces.
2. Understand the role of the favorably designed rest seat in controlling the direction of stresses.
3. Appreciate the importance of well prepared guiding planes in the distribution and control of stresses.
4. Be aware of the ability of a biomechanically designed occlusion to minimize undesirable forces.
5. Be able to design a direct retainer with optimal contour and placement that provides adequate retention with minimal spring tension.
6. Have a clear understanding of the role of the altered cast technique (or other two-stage impression technique) in the distribution of stresses for the extension-base RPD.
7. Be familiar with the historical development of philosophies of stress control for RPDs.
8. Be aware of the consequences of inadequate stress control with RPDs.

**Learning unit:** Survey of the diagnostic cast and design of the framework  
**Course:** Postdoctoral Removable Partial Dentures

**Learning objectives:**

After completion of this learning unit the student should:

1. Know the eight steps involved in surveying and designing the RPD framework and be able to carry out these steps.
2. Understand the component parts and use of the dental surveyor.
3. Be able to determine the most favorable path of insertion for the RPD framework.
4. Understand the nature of the survey line and its influence on the design of the framework.
5. Be able to locate desirable support (rests) for the cast framework.
6. Be able to plan and design guiding surfaces for the framework.
7. Be able to effectively design rigid major and minor connectors that are mechanically sound and physiologically contoured.
8. Be able to locate appropriate undercuts and plan effective retention for the prosthesis with biomechanically designed clasp assemblies.
9. Be able to preserve the planned path of insertion and plan mouth preparations based on the surveyed diagnostic cast with outlined framework.

**Learning unit:** Mouth preparations  
**Course:** Postdoctoral Removable Partial Dentures

**Learning objectives:**

After completion of this learning unit the student should:

1. Understand the importance of using the surveyed diagnostic cast with outlined framework as a guide when planning and executing mouth preparations.
2. Be aware of the importance of thorough mouth preparations to ensure desired fit, configuration, and function of the cast framework.
3. Know the sequence of steps for mouth preparations.
4. Be able to prepare multiple, parallel guiding planes that are coincident with the planned path of insertion.
5. Be able to prepare positive rest seats and to evaluate occlusal clearance of the rest preparations.
6. Be able to modify existing tooth contours to develop favorable survey lines consistent with the planned design of the framework and to eliminate undesirable undercuts.
7. Understand the techniques and limitations of “creating retentive undercuts” for clasps.
8. Be able to correct minor occlusal discrepancies with selective grinding.
9. Be familiar with indications and techniques for preprosthetic surgery — including correction of unfavorable tori, undercuts, hyperplastic tuberosities, and hypermobile soft tissue.

**Learning unit:** Impression procedures  
**Course:** Postdoctoral Removable Partial Dentures

**Learning objectives:**

After completion of this learning unit the student should:

1. Be familiar with the requirements of the final impression.
2. Be familiar with the currently available materials and techniques for making accurate final impressions.
3. Understand the requirements for the care of the final impression based on the type of impression material used.
4. Be able to critically evaluate a final impression and understand the reasons for rejecting a final impression.
5. Be able to pour an accurate, usable, and durable master cast from the final impression.
6. Understand the requirements for care of the master cast.

**Learning unit:** Laboratory procedures for framework fabrication  
**Course:** Postdoctoral Removable Partial Dentures

**Learning objectives:**

After completion of this learning unit the student should:

1. Be able to tripod the master cast to “define” the path of insertion.
2. Be able to survey the master cast and outline the framework to the desired contour and dimensions.
3. Be able to bead the maxillary master cast to define the borders of the major connector.
4. Understand the four reasons for beading of the maxillary major connector.
5. Understand the techniques and objectives of blockout and relief of the master cast.
6. Understand the difference between tapered and parallel blockout of the master cast and be able to direct the technician to provide the desired blockout.
7. Be familiar with techniques for duplication of the master cast in a refractory material.
8. Understand the materials and techniques for developing the wax pattern for the framework.
9. Be familiar with spruing, investing, casting and finishing techniques for the RPD framework.
10. Understand the techniques for the fabrication of a combination clasp.
11. Be able to write an acceptable work authorization to direct the technician in the fabrication of a high quality RPD framework.

**Learning unit:** Framework try in and adjustment; the altered cast technique  
**Course:** Postdoctoral Removable Partial Dentures

**Learning objectives:**

After completion of this learning unit the student should:

1. Appreciate the importance of trial fitting of the framework.
2. Be able to effectively evaluate the fit of the framework and understand the reasons for rejecting a framework.
3. Be able to disclose and adjust the framework to eliminate seating interferences and binding areas.
4. Be able to adjust the framework to eliminate occlusal interferences.
5. Be able to finish and polish ground surfaces after framework adjustment.
6. Thoroughly understand the importance of the altered cast impression for favorable fit and optimal stress control with a mandibular extension-base RPD.
7. Be able to make an accurate altered cast impression and pour this impression to correct the master cast.
8. Understand the significance of and reasons for lack of contact between the cast and the tissue rest of the framework that commonly occurs after the altered cast technique; and be able to re-establish a tissue rest.

**Learning unit:** Occlusion  
**Course:** Postdoctoral Removable Partial Dentures

**Learning objectives:**

After completion of this learning unit the student should:

1. Understand the characteristic features of a healthy, natural occlusion.
2. Know the difference between the envelope of motion (Posselt) and the envelope of function (Gibbs and Lundeen).
3. Be aware of the effects of tooth loss on the integrity of the occlusion.
4. Be able to plan modifications to the existing occlusal scheme for desirable occlusal function with the planned prosthesis.
5. Understand the anatomy and physiology of the TMJ and muscles of mastication related to the biomechanics of mandibular function.
6. Be able to integrate the artificial teeth of the RPD effectively with functional mandibular movements and natural tooth guidance to maximize stability and comfort with the RPD and enhance stress control.
7. Be able to provide a rational occlusal scheme for an extension-base RPD that occludes with natural teeth, fixed prosthodontics, an RPD, and a complete denture.
8. Understand the role of the Hanau Quint when evaluating the existing occlusion and developing the artificial occlusion.
9. Know the basic features of a semi adjustable articulator and the application of the articulator to RPD occlusion.

**Learning unit:** Processing techniques  
**Course:** Postdoctoral Removable Partial Dentures

**Learning objectives:**

After completion of this learning unit the student should:

1. Be able to complete the final wax-up for the RPD.
2. Be able to invest the RPD in a denture flask.
3. Be able to boil out, pack, and process the denture bases.
4. Be able to deflask, finish, and polish the RPD.
5. Understand some of the problems that can occur with processing of the RPD and be able to avoid these problems.

**Learning unit:** Insertion and post-insertion care  
**Course:** Postdoctoral Removable Partial Dentures

**Learning objectives:**

After completion of this learning unit the student should:

1. Be able to evaluate and adjust the fit of the denture base.
2. Be able to evaluate the fit of the framework of the finished prosthesis and understand the conditions that can cause alterations in the fit after processing.
3. Be able to adjust the retentive arms of the RPD if necessary.
4. Be able to evaluate and adjust the occlusion, and to understand the indications for a clinical remount of the prosthesis.
5. Be able to instruct the patient on the care, maintenance, hygiene, and use of the prosthesis.

**Learning unit:** Relines  
**Course:** Postdoctoral Removable Partial Dentures

**Learning objectives:**

After completion of this learning unit the student should:

1. Be able to evaluate the fit of the denture base at recall appointments and determine the need for relining the denture base to re-establish tissue support.
2. Be able to perform the clinical and laboratory procedures for relining the RPD.
3. Understand the reasons for altered occlusal relationships after a reline procedure, and be able to adjust the occlusion to coincide with the fit of the relined denture base.
4. Be able to determine when a reline procedure will not correct problems.

**Learning unit:** Integrated fixed and removable prosthodontics: crowned abutments  
**Course:** Postdoctoral Removable Partial Dentures

**Learning objectives:**

After completion of this learning unit the student should:

1. Be able to effectively plan the combined fixed/removable prosthesis.
2. Have a clear understanding of the desired contours of the crowned abutment consistent with the planned design of the RPD.
3. Be aware of the necessary modifications to traditional tooth preparations for the artificial crown that will serve as an abutment to an RPD.
4. Be able to perform the laboratory procedures for construction of artificial crowns (all metal crowns and metal ceramic crowns) with favorable contours that will serve as abutments to RPDs.
5. Be able to effectively instruct a technician to fabricate artificial crowns (all metal crowns and metal ceramic crowns) with favorable contours that will serve as abutments to RPDs.

**Learning unit:** Attachment-retained RPDs  
**Course:** Postdoctoral Removable Partial Dentures

**Learning objectives:**

After completion of this learning unit the student should:

1. Understand the fundamental differences between the precision and semi-precision attachment.
2. Know the advantages, disadvantages, indications, and contraindications of the attachment-retained RPD.
3. Be aware of the need for comprehensive planning and stress control with the attachment-retained RPD, and be able to plan the prosthesis effectively.
4. Understand the clinical and laboratory procedures for treatment of the patient who requires an attachment-retained RPD, and be able to carry out these procedures.

## REMOVABLE PARTIAL DENTURES—PRINCIPLES OF DESIGN AND STRESS CONTROL

### METHODS OF MINIMIZING STRESS TO THE TEETH AND EDENTULOUS RIDGES:

#### *Enhance the supportive nature of the teeth:*

- Occlusal adjustment to eliminate primary trauma from occlusion
- Splinting of teeth (when indicated) with cast restorations or with rigid components of the RPD itself
- Well prepared and positioned guiding planes
- Favorably designed and positioned rest seats

#### *Improve the supportive nature of the edentulous area:*

- Surgical correction of flabby soft tissue covering
- Two-stage impression technique in the mandible
- Maximal denture base coverage within physiologic limits
- Relining the denture base when indicated

#### *Minimize forces transmitted to the teeth and edentulous ridges:*

- Reducing the length and bucco-lingual width of the occlusal table
- Maintaining the sharpness of cusps
- Providing adequate sluiceways to the occlusal anatomy

#### *Favorably distribute the load between the abutment teeth and the edentulous ridges:*

- Physiologic relief of the cast metal framework (rigid components must NOT bind on the teeth)
- Physiologic development of the denture base borders (maximal support, stability, and retention obtained from the denture base)
- Selective loading in the mandible; broad palatal coverage with the maxillary major connector
- Broad stress distribution (rigid RPD design, indirect retainers, well-formed parallel guiding planes with favorably placed proximal plates, etc.)
- A clasp assembly that provides direct retention with MINIMAL spring tension (0.01 inch undercut for all clasps, except 18-gauge wrought precious wire and 19-gauge base-metal wire which may engage 0.02 inch undercut)
- A nondeflective occlusion whereby natural and artificial teeth occlude simultaneously in MIP with NO eccentric interferences.

STEVEN M. MORGANO, DMD

## **Attachment-retained Removable Partial Dentures**

Remo A. Sinibaldi, DMD  
Former Professor and Chairman  
Department of Restorative Sciences  
Boston University School of Dental Medicine

### ATTACHMENTS

Dr. Remo A. Sinibaldi

\* Over 200 available

Attachments can be categorized on the basis for which they are designed:

- A. Removable Partial Dentures
  - 1. Intracoronal or Extracoronal
  - 2. Rigid or Resilient
  - 3. Precision or Semi Precision
- B. Segmented Fixed Bridgework
  - 1. Precision or Semi—precision
- C. Overdentures
  - 1. Bars
    - a. Clips or magnets
    - b. Precision or semi—precision
  - 2. Radicular studs
    - a. Rigid or resilient
    - b. Replaceable or adjustable parts
  - 3. Intraradicular anchors

### Considerations when selecting attachments

- 1. Periodontal support of potential abutments
- 2. Condition of residual ridge and other soft tissue support
- 3. Opposing arch - natural teeth or removable appliance
- 4. Vertical height of abutment teeth
- 5. Size of abutments - large pulp.
- 6. Strength of bite
- 7. Number of abutments - double abutments minimum
- 8. Patient dexterity
- 9. Alloy to be used for crowns

### I. History

Until 1915, all machine-made precision attachments used in the mouth were extracoronal attachments. Goslee 1 discusses various attachments, some of which could be soldered on to a crown (such as the Roach Attachment and Condit Attachment) thus allowing for retention of a removable prosthesis. He felt that an advantage of manufactured attachments lay in the secure fixation allowed by their usage and the time saved by being able to buy the attachments ready-made. However, Goslee felt the disadvantages were such that he would never recommend the

universal use of attachments. Some major problems were the inherent weakness of the attachments, the great degree of skill required for installation which the average dentist did not usually possess, the extent of space occupied by the attachment, possible loosening of the attachment parts which would render them useless, the inability to overcome this loosening via easy adjustments, and finally, the leverage imposed upon the supporting teeth which may be so severe as to result in their subsequent loosening or ultimate loss. The majority of the disadvantages listed still plague the use of precision attachments.

In 1915, Herman Chayes<sup>2</sup> introduced the use of intra coronal attachments that allowed one to retain the vitality of the tooth. Along with his new attachment, Chayes advanced the theory that it was best that an attachment be fully seated only when in function, a view still held today.

## **PR 807, 808, 809 Seminar: Patient Presentation and Treatment Planning**

**Course Instructor:** Dr. Maher Atassi

**Office Hours:** Sunday – Thursday 9:00 am to 4:00 pm

**Credit Hours:** 1

**Prerequisites:** D.M.D. or D.D.S. with Fixed, Removable, and Complete Prosthodontic Course as background.

**Co-Requisites:** None

**Course Description:** This course will consist of patient presentations to include diagnosis and treatment planning, treatment in progress, and treatment completed during your educational program. Students from all three years of the program attend. The format must be strictly followed so that all may benefit from the presentations. For most of you this will be your first experience in conducting a seminar; therefore, proper preparation is mandatory.

### **Intended Learning Outcome:**

This course prepares the student to:

- Present documentation of a patient requiring treatment by outlining the diagnostic and treatment planning aspects in a format that can be readily followed and understood.
- Classify edentulous, and completely dentate patients and partially edentulous according to the classification system established by the American College of Prosthodontists.
- Defend and explain diagnostic and treatment planning decisions in an open forum, among faculty and peers.
- Gain experience and confidence in developing a formal educational presentation and giving a presentation before a professional audience.
- Gain experience in the use of the audio-visual materials and techniques to present before a professional audience.

**Course Topics and Content:** This course is a series of case presentation seminars discussing the diagnosis and treatment planning and treatment of specific clinical cases.

### **Assignments and Due Dates:**

**Final Patient Presentation** (Graduation Requirement)

This formal presentation must include at least five patients with completed treatment.

All patients must be fully documented, with slides, for all relevant clinical and laboratory procedures and must include at least one patient from each of the following categories:

1. Complex fixed prosthodontic care
2. Complete denture prosthodontics
3. Implant-supported prosthodontics
4. Combined fixed/removable prosthodontics
5. Removable partial prosthodontics

A complete series of slides depicting the pre-operative condition and final restorations are to be submitted for approval *prior* by Dr. AlDousari. After the presentation, Dr. AlDousari must receive a copy of the presentation on a disc. This is a formal graduation requirement and the disc will be stored in your red sign-out book.

#### Format for Presentation

The presentation should be a series of digital images that clearly describe the following:

1. Patient's age, gender, race, occupation
2. Referral source
3. Chief complaint
4. Medical history
5. Dental history
6. Oral hygiene habits
7. Attitude, personality and behavioral evaluation
8. Extraoral examination, including temporomandibular joints and muscles of mastication
9. Intraoral examination (clinical and radiographic)
  - a. Occlusion (intraorally and on mounted casts)
    - Static-Angle's classification in MIP, vertical and horizontal overlap
    - Dynamic-lateral working and non-working relationships, and protrusion
  - b. Evaluation of occlusal stability and inter-arch relationship
  - c. Evaluation of existing dental treatment
  - d. Tooth-by tooth evaluation in sextants (clinical and radiographic)
  - e. CT scan evaluation for patients planned for implant-supported prostheses
  - f. Periodontal examination
10. Diagnosis (The diagnosis must be a complete diagnosis that incorporates all disease processes. Any treatment planned or provided must flow logically from definitive diagnosis.)
11. Etiology
12. Contributing factors
13. ACP classification
14. AAP classification
15. Proposed treatment plan with wax replica
16. Treatment sequence of proposed plan clearly described in phases
17. Prognosis of proposed plan
18. Alternative plan(s) (There must be at least one alternative plan with photos of the wax replica)
19. Treatment sequence of alternative plan clearly described in phases
20. Prognosis of alternative plan

## 21. Treatment to date

The duration of the presentation should be approximately 30 minutes.

**Methods and Dates of Student Evaluations:** The grade for those who do not present will be based entirely on attendance. Those who present will have the quality of the presentation evaluated by faculty using standard forms. These evaluations of the presentation will represent 75% of the final grade, with attendance representing the remaining 25%.

**Teaching and Learning Methodologies:** Instructor-guided student-led seminars

### **Course Text, Recommended Reading, Material, and Resources:**

The following materials are required for your presentation:

1. Mounted diagnostic casts in centric relation;
2. PowerPoint digital presentation;
3. Mounted wax replica of the proposed treatment plan.

## **PR 814: Removable Prosthodontics: Overlay Dentures**

<b>Course Instructor:</b>	Dr. Nawaf AlDousari
<b>Office Hours:</b>	Sunday – Thursday 9:00 am to 4:00 pm
<b>Credit Hours:</b>	1 credit
<b>Prerequisites:</b>	D.M.D., D. D.S. or equivalent
<b>Co-Requisites:</b>	None

**Course Description:** The goal of this course is to expand the students' knowledge gained in the Postdoctoral Complete Denture course. In addition, this course reviews various methods of overlay complete denture treatments for patients with minimal remaining teeth, as well as patients with complete dentures supported and retained with dental implants.

**Intended Learning Outcome:** At the completion of this course, the student should know the following:

1. The rationale of overdenture treatment
2. The benefits of overdenture treatment, and be able to provide appropriate diagnosis and treatment planning for patients who are candidates for overdenture treatments
3. A variety of techniques for tooth-supported and implant-supported overdentures
4. Application of the principles and techniques, which they have learned, to their clinical practices

### **Course Topics and Content:**

- Diagnosis and treatment planning for conventional dentures versus overdentures
- Various impression techniques according to type of support
- Indications for various designs of posterior palatal seal
- Facebow and centric relation records, mounting procedures
- Zest Anchor attachments
- Magnet—Dolder Bar—OSO Attachment systems
- Overdenture, bar-type reconstruction
- Case reports on stud and bar attachments
- Triad 2000 light-curing system
- Tooth selection—setting of artificial teeth and need for alterations (patient's remount procedures)of artificial teeth during fabrication
- Astra Tech attachments for overdenture treatment
- Use of soft liners in preparation for overdenture
- Prosthetics portfolio
- Tooth Selection:
  - 0 degree

- 10-20 degrees
- 30 degrees

Dentsply System:

Ivoclar Tooth Selection: Indications for different occlusal forms and methods of arrangement of artificial teeth, both acrylic resin and porcelain when indicated.

Diagnosis and fabrication for:

- Complete dentures with cast metal palate
- Complete cast base for complete dentures

**Assignments and Due Dates:** Course attendance and participation is required

**Methods and Dates of Student Evaluations:** There will be a final examination and the grade will be based on the results of this examination.

**Teaching and Learning Methodologies:** Lecture and discussion format

**Course Text, Recommended Reading, Material, and Resources:** Literature review of the previous years' (2007-2008) articles in regard to overlay dentures.

## **PR 815: Basic Prosthodontic Techniques**

<b>Course Instructor:</b>	Dr. Steven Morgano
<b>Office Hours:</b>	By appointment or via e-mail
<b>Credit Hours:</b>	2
<b>Prerequisite:</b>	D.M.D., D. D.S. or equivalent
<b>Co-Requisites:</b>	None

**Course Description:** The purpose of this course is to provide hands-on instruction in the clinical and laboratory techniques that are essential for the postdoctoral prosthodontic program. It is assumed that each graduate student has at least a basic experience in these techniques; nevertheless, since students come from different national and international dental schools, this course establishes a common baseline.

Throughout the three-year program, postdoctoral students are expected to perform laboratory procedures pertaining to: provisional restorations, pouring casts, making master casts with removable dies, characterizing and glazing porcelain restorations, posts and cores, fixed restorations and laboratory procedures for complete and partial removable dentures. These laboratory procedures will be comprehensively reviewed in this course.

**Intended Learning Outcome:** Proficiency in prosthodontic laboratory and clinical procedures

**Course Topics and Content:** Detailed information on each topic below is included at the end of this syllabus.

- I Tooth Preparations
- II Impression Making
- III Master Casts with Removable Dies
- IV Autopolymerizing Provisional Restorations
- V Heat Processed Provisional Restorations
- VI Setting of Artificial Teeth for Complete Dentures
- VII Processing and Finishing Complete Dentures
- VIII Post and Core Fabrication
- IX All-metal Cast Restorations
- X Metal Ceramic Technique
  - a. Waxing and casting procedures
  - b. Porcelain application
- XI Gnathology
  - a. Alginate Impression, Facebow, Lucia Jig

- b. Articulator
  - 1. Fully-adjustable
  - 2. Semi-adjustable
- XII Occlusal Splint (occlusal device)
- XIII Implants

**Assignments and Due Dates:** See course schedule at the end of this syllabus.

**Methods and Dates of Student Evaluations:** Upon completion of the course, a practical examination affords the faculty the opportunity to formally evaluate each student. Based on these evaluations, the faculty will determine whether the student has adequate skills to enter the clinic. Remedial training will be provided for any deficiencies. The total number of clock hours for the preclinical course is approximately 350 hours.

**Teaching and Learning Methodologies:** Lecture, demonstration and preclinical laboratory

**Course Text, Recommended Reading, Material, and Resources:** See course schedule at the end of this syllabus.

## Course Topics

### **I Tooth Preparation**

Techniques and designs described in Shillingburg HT, Jacobi R, and Brackett SE, Fundamentals of Tooth Preparations. Chicago: Quintessence Publishing Co., Inc., 1987, will be used as guidelines with demonstrations.

### **II Impression Making**

Faculty will demonstrate and supervise the making of final impressions of tooth preparations.

### **III Master Casts with Removable Dies**

Faculty will provide instruction on the fabrication of master casts with removable dies made with the Pindex system.

### **IV Autopolymerizing Provisional Restorations**

Methyl methacrylate is the preferred material for provisional restorations because of its color stability and durability. The most common technique includes making an impression or vacuum shell prior to tooth preparation and using this impression or shell as a template for the soft acrylic resin. After tooth preparation the template containing the soft acrylic resin is inserted in the mouth and allowed to set. During the setting, the template with resin must be removed and reinserted repeatedly to prevent locking as a result of polymerization shrinkage or setting of the resin into undercuts.

If multiple teeth are lost, or for some reason it is impossible to make a prior impression, the “block” technique is indicated. Autopolymerizing acrylic resin is mixed and allowed to set to a doughy consistency. The resin is shaped into a block, inserted on the tooth preparations and the patient is instructed to occlude into the soft acrylic resin. During the setting process the block is removed and reinserted repeatedly to prevent locking or overheating the teeth as a result of the exothermic chemical reaction. A continuous water spray is suggested. After final setting, the block of resin is removed, the fitted surface relieved and relined with soft acrylic resin to ensure accurate fit and marginal adaptation. The block is removed from the mouth and contoured to the desired shape. Occlusion is adjusted, and the provisional restoration is finished and polished.

### **V Heat Processed Acrylic Provisional Restorations**

Diagnostic casts are mounted on an articulator and the gingival margins and interproximal areas are marked with pencil on the casts. Silicone putty indices are made of the facial and occlusal surfaces of all teeth to be temporized. The teeth are minimally prepared on the casts and then painted with a separating medium. The teeth are waxed to desired contours by using the silicone matrix and an eyedropper to flow in the molten ivory wax. The wax patterns are refined and removed from the casts and invested in denture flasks. The wax is boiled out in the conventional manner. The plaster in the flasks is coated with a separating medium (AL COTE). Heat curing acrylic resin (Namilon or Biolon) is packed and compressed in the conventional manner, and after initial setting the incisal edges are cut away with a sharp scalpel and the incisal shade of acrylic resin is applied. After

processing in boiling water for one hour, the provisional restorations are deflasked, cleaned, trimmed, and placed back on the casts to adjust occlusion. These provisional shells will be relieved and then relined in the mouth.

#### **VI Setting of Artificial Teeth for Complete Dentures**

Faculty will distribute all necessary materials for the setting of zero-degree teeth and anatomical teeth along with technical instructions. Students will also make custom trays and record bases and occlusion rims during these technical exercises. Faculty will assist you in the arrangement of the artificial teeth.

#### **VII Processing of Complete Dentures**

Students will wax, invest, finish, and polish maxillary and mandibular complete dentures. A laboratory remount will be performed to develop balanced articulation. Faculty will provide demonstrations and supervision for these procedures.

#### **VIII Post and Core Fabrication**

Faculty will demonstrate procedures for fabricating custom-fitted cast metal posts and cores and prefabricated posts with amalgam cores. Students will then perform these procedures on endodontically-treated extracted teeth.

#### **IX All-Metal Cast Restorations**

Staff from the professional laboratory will provide instruction on waxing, investing, casting, finishing and polishing cast restorations.

#### **X Metal Ceramic Technique**

This exercise consists of two parts: Metal Casting and Porcelain Application.

##### **a. Metal Casting**

###### **1. Wax Pattern**

The first step for making the metal ceramic casting is the application of die relief. Allow die relief to dry, apply die lubricant and flow a thin coat of wax on the die. Seat the die onto the mounted cast and wax the crown to complete contour. The desired thickness of porcelain is 1-1.5 mm on the facial surface and 1.5-2.0 mm at the incisal or occlusal surface. Cut back the wax to provide space for the porcelain veneer.

Remove the die from the cast by pushing the die out from the bottom of the cast. Smooth the wax and check for desired thickness, which should be no less than 0.3 mm. Place a red pencil line to highlight the margin, apply another thin coat of lubricant to the die and reseat the wax pattern on the die. Rewax the margin to correct any deficiencies. Use an instrument with an edge that is not sharp to trim any overextensions of wax at the margin. Ensure that the pattern can be removed and replaced on the die while maintaining marginal integrity, and then replace the die on the cast. Once the wax pattern is complete, sprue and invest. Attach an 8-gauge wax sprue to incisal/occlusal surface.

###### **2. Investing**

Investment should be used according to manufacturer's instructions. After removing the wax pattern from cast, examine it to ensure that there has not been distortion. Attach the pattern to the sprue former, flowing wax to create a smooth passage for molten metal during the casting procedure. By using a clean brush apply debubbler solution to the wax pattern and gently blow dry. This procedure will reduce the surface tension of the wax and result in a smoother casting. Attach the metal ring that has been lined with asbestos-free liner. The liner allows the desired expansion of the investment. Mix investment according to manufacturer's instructions and invest. There are many techniques to invest. It is important to avoid entrapment of air bubbles inside the pattern. Pour investment into the ring, covering the unit. Pour investment back into the bowl. Next use the tip of a brush to push the investment down into the fitted surface of the wax pattern, then up the side. This procedure will eliminate any air bubbles that may have been trapped. Fill the wax pattern with investment by using the brush. Finally, fill the ring to cover the wax. The investment should be approximately 5-10 mm over the top of the wax pattern. Allow the ring to set one hour. Scrape the top of the investment to break the surface and expose the pores of the investment. Removal of the outer surface will allow gas to escape when molten metal flows into the mould.

### 3. Casting

Preparation before casting is essential because once melting of the alloy has begun; full concentration is necessary for a successful casting.

The number of revolutions when winding a centrifical casting machine varies depending on the size of the casting ring and the age of the tension spring in the machine. A small or medium ring typically needs two full turns of the casting arm. Three turns are necessary for the larger rings.

Place the cradle into the casting machine. The cradle holds the ring in alignment with the crucible. It is important to keep separate crucibles for each alloy to avoid cross contamination.

Place the fresh alloy in the bottom of the crucible and the clean button on top of the alloy. If there is a large button of previously melted alloy, it is advisable to melt this first and then add fresh alloy.

Use casting glasses to protect your eyes. Light the torch and establish the correct flame. Depending on the alloy to be cast, the temperature will vary. Apply the flame to the crucible and melt the alloy. Do not overheat the metal because overheating can result in rough castings as well as bonding problems at the porcelain phase.

Once the alloy is molten, remove the ring from the oven and place it into the cradle. Gently slide the crucible into contact with the ring. Release the casting arm carefully because a rough release will result in a turbulent flow of the alloy

with potential miscast. Allow the arm to spin freely until it stops. Bench cool or quench the casting following the manufacturer's instructions.

## **b. Porcelain Application**

### Materials for Porcelain Application

1. Distilled water
2. Tissues (Kleenex)
3. #5 or #6 pointed sable brush
4. Modeling spatula
5. Blade
6. Glass rod
7. Hemostat

### Procedure

#### 1. Oxidization of metal

##### Preparation of Metal

- Sandblast metal surface with 50 micron powder
- Steam clean
- **Do NOT Touch Metal Surface**
- Oxidize metal in porcelain oven

This process eliminates any contaminated gases in the metal and develops an oxide layer. Contamination can cause bubbles in the porcelain. An oxide layer is necessary for porcelain bonding.

#### 2. Air abrasion

- After the metal has been oxidized, air abrade the surface to thin the oxide layer and steam clean.
- Do not handle the casting with bare hands. Oil from your fingers will contaminate the metal.

#### 3. Opaque

There are two steps for opaquing. The first step is the application of a thin slurry of opaque porcelain painted evenly on all areas that will receive porcelain. This first application develops the bond to metal.

- Fire opaque.
- A second opaque layer is applied to mask the metal.

#### 4. Porcelain Application

- Prepare the cast.
- Apply body porcelain by keeping the porcelain at a creamy consistency.
- Cut back the incisal one-third to develop space to add incisal porcelain.
- Overbuild all contours and lengths because porcelain will shrink approximately 1 mm in all directions.
- After porcelain is applied and contoured, remove the crown from the cast and add proximal contacts. Excess moisture in the porcelain can cause

cracking. The porcelain should be placed in the oven slowly and baked under vacuum. Slow removal is also necessary.

#### 5. Porcelain Finishing

- Air abrade the fitted surface of the casting to eliminate any porcelain that may have inadvertently been left inside the casting. Avoid the margins with the abrasive.
- Remove adjacent sections on the cast and seat the crown. Add one section back and adjust the proximal contact. Adjust the other proximal contact. Adjust occlusion by using marking ribbon to identify hypercontacts and contour surfaces accordingly. Grind metal to follow porcelain contours by eliminating any excess bulk of metal and porcelain most importantly around the margin. Develop contours by working from the emergence profile towards the incisal.

Materials used are: aluminum oxide stones, separating disc, diamond discs, 557 high-speed burs, and ribbon for marking.

#### 6. Second Bake Porcelain Application

If porcelain crowns need an additional bake, steam clean. Mix porcelain same as in first buildup. Try to confine porcelain to areas where it is needed, i.e. Ridges and contacts. Porcelain will not shrink as in first bake. Fire porcelain, same as in first bake.

#### 7. Porcelain Glazing

- Finalize the porcelain contours and texture, and ensure that the surface is smooth and free of pits or voids. Metal should also be clean of any porcelain and contoured to the desired form.
  - Use a shade guide to match the desired shade.
  - Set up stains with powders from the staining kit.
  - Use the corresponding colors for the specific shade.
  - Example: #709 corresponds with shades A1-A4.
  - Mix the powders with fresh glycerin. Too many glycerins will cause the stain to puddle.
  - Apply colorants with a #1 or #0 brush uniformly.
  - Air fire crowns. No vacuum should be used during the final glazing procedure.

## XI Gnathology

### a. Alginate Impressions, Facebow, Lucia Jig

#### Clinical phase:

Alginate impression technique:

Students are paired and make maxillary and mandibular impressions for each other.

#### Laboratory phase:

1. Impressions are poured in dental stone.

2. Casts are trimmed.
3. Facebow records are made to mount maxillary casts. Each student will make an anterior jig (Lucia jig) in preparation for making of the occlusal device (separate exercise).

Note: The objective of this session is to ensure that the students are prepared to perform fundamental procedures. Accurate casts are necessary for the technical exercise devoted to fabrication of the occlusal device. Also, the Lucia jig will be used to mount casts in centric relation when the occlusal device is fabricated.

**b. Articulators**

Semi-adjustable articulators will be used to fabricate the occlusal device (occlusal splint). Faculty will arrange for hands-on instruction on the use of fully-adjustable articulator in January.

**XII Introduction to Implantology (Dr. Zhimon Jacobson)**

1. Review of prosthetic kit and components
2. Fabrication of surgical stents
3. Introduction to CT scan evaluation
4. Different impression methods
5. Preparation of impression and placement of lab analog
6. Cast fabrication
7. Soft tissue replica
8. Radiographic methods to evaluate implants
9. Dental photography

## Basic Prosthodontic Techniques PR 815 Course Schedule July 2008

SUNDAY	MONDAY	TUESDAY	WEDNESDAY	THURSDAY
		1 School Orientation	2 School Orientation	3 School Orientation
6  SCHOOL ORIENTATION	7 <u>9am-12pm</u> Departmental orientation <u>12pm-1pm</u> Lunch <u>1pm-5pm</u> - Equilibrate Dentoform -Alginate impression of Dentoform for diagnostic waxing	8 <u>9:45am-12pm</u> OSHA Requirements <u>1 pm-5pm</u> Mounting of diagnostic casts on semi-adjustable articulator for complete mouth diagnostic waxing	9 <u>9am-5pm</u> Tooth preparations: - All metal complete crown for mandibular molar  - PFM crown for maxillary premolar and molar as an abutment to FPD PFM	10 <u>9am-12pm</u> Practice tooth preparations. <u>1 pm-5pm</u> Tooth preparations - All-ceramic crown for maxillary central incisors - Metal onlay preparation for mandibular molar
13 <u>9am-5pm</u> Tooth preparations Practice and complete tooth preparations	14 <u>9am-5pm</u> - Final impression for mandibular all- metal complete crown , onlay preparation and maxillary FPD PFM	15 <u>9am-5pm</u> Demonstration of fabrication of record base for complete denture	16 <u>9am-5pm</u> Two sets of master casts with removable dies for all metal complete crown, cast gold onlay and maxillary FPD PFM	17 <u>9-10</u> Room TBA -Face bow, CR, interocclusal record -Mounting of diagnostic casts on semi-adjustable articulator.
20 <u>9am-5pm</u> Fabrication of wax pattern for occlusal device.	21 <u>9am-5pm</u> Demonstration of fabrication of occlusal wax rims for complete denture and mounting of casts on semi-adjustable articulator.	22 <u>9am-5pm</u> Completion of 0- degree tooth set-up and start with 20- degree tooth set-up for complete dentures	23 <u>9am-5pm</u> Investment, processing, finishing and polishing of occlusal device.	24 <u>9am-5pm</u> -Tooth preparation and wax pattern for maxillary processed 6-unit provisional FPD
27 <u>9am-5pm</u> Investment and insertion of occlusal device	28 <u>9am-5pm</u> -Continue with complete dentures	29 <u>9-5pm</u> - Fabrication of all- metal complete crown for mand. molar and cast gold onlay	30 <u>9-12pm</u> - Fabrication of all- metal complete crown for mand. molar and cast gold onlay <u>1-3pm</u> Tooth preparation -Laminate veneers <u>3-7pm</u> Processing of complete dentures	31 <u>9-12pm</u> -Tooth preparation and wax pattern for complete- mouth diagnostic waxing <u>1-5pm</u> Investing and processing of occlusal device

## Basic Prosthodontic Techniques PR 815 Course Schedule August 2008

SUNDAY	MONDAY	TUESDAY	WEDNESDAY	THURSDAY
3 <u>9-5pm</u> - Implant prosthodontics	4 <u>9-5pm</u> - Implant Prosthodontic	5 <u>9-5pm</u> - Implant Prosthodontic	6 <u>9-5pm</u> - Implant Prosthodontic	7 <u>9-5pm</u> - Implant prosthodontics
10 <u>9-5pm</u> -Continue with complete-mouth diagnostic waxing	11 <u>9-5 pm</u> -Lab remount of complete dentures and occlusal equilibration. Polishing and finishing of complete dentures	12 <u>9-5 pm</u> - Continue with all-metal crown and gold onlay	13 <u>9-5pm</u> - Continue with all-metal crown and gold onlay	14 <u>9-5pm</u> -Insertion of occlusal device
17 <u>9-5pm</u> Fabrication of metal framework for 3-unit FPD PFM	18 <u>9-5pm</u> Continue with metal framework	19 <u>9-5pm</u> Continue with metal framework	20 <u>9-12pm</u> EXAM Tooth preparation <u>9-12pm</u> Investing and processing of complete-mouth waxup	21 <u>9-5pm</u> Metal ceramics, demonstration of ceramic application
24 <u>9-5pm</u> Metal ceramics, demonstration of ceramic application	25 <u>9-5pm</u> Metal ceramics, demonstration of ceramic application	26 <u>9-5pm</u> -Metal ceramics, completion of ceramic application, glazing and staining for PFM FPD	27 <u>9-5pm</u> Relining, polishing and finishing of complete-mouth provisional FPDs	28 <u>9-12pm</u> Completion of ceramic application <u>1-5pm</u> -Continue with complete-mouth provisional FPD & ceramics

## Basic Prosthodontic Techniques Course PR 815 Schedule September 2008

SUNDAY	MONDAY	TUESDAY	WEDNESDAY	THURSDAY
31  HOLIDAY	1  <u>9-12pm</u> - Introduction to laminate veneers Mr. Mohammed Processing of complete-mouth waxing	2  <u>9-12pm</u> Continue with complete dentures Dr. Mark <u>1-5pm</u> Preparation of master cast with removable dies for laminate veneers	3  <u>9-5pm</u> Wax patterns for laminate veneers	4  <u>9-5pm</u> Relining, polishing and finishing of complete-mouth provisional FPDs
7 <u>9-5pm</u>  Continue with finishing of complete-mouth provisional FPDs	8 <u>9-5pm</u>  Investment and casting of laminate veneers	9 <u>9-5pm</u>  Continue with finishing of complete-mouth provisional FPDs	10 <u>9-5pm</u>  - Cementation of laminate veneers	11 <u>9-5pm</u>  -Preparation for exam
14 <u>EXAM</u> 9 - 5	15 <u>EXAM</u> 9 - 5	16 <u>EXAM</u> 9 - 5	17 <u>EXAM</u> 9 - 5	18 <u>EXAM</u> 9 - 5
21 MAKE-UP WORK	22 MAKE-UP WORK	23 MAKE-UP WORK	24 MAKE-UP WORK	25 MAKE-UP WORK
28  CLINICAL ORIENTATION	29	30		

## **PR 818: Principles of Gnathology**

<b>Course Instructor:</b>	Dr. Nawaf AlDousari
<b>Office Hours:</b>	Sunday – Thursday 9:00 am to 4:00 pm
<b>Credit Hours:</b>	1
<b>Prerequisites:</b>	D.M.D., D. D.S. or equivalent
<b>Co-Requisites:</b>	None

**Course Description:** The goal of this course is to review the historical development of gnathologic principles and techniques, including the use of the pantograph and completely adjustable articulator.

### **Intended Learning Outcome:**

At the completion of this course, the student will:

- Know the history of gnathology as a philosophy of occlusal treatment
- Be able to integrate gnathologic principles and techniques into the clinical practice of Prosthodontic
- Understand the relationship between the biomechanics of jaw movement and occlusal morphology
- Know the instrumentation used for programming a completely adjustable articulator and be able to apply this knowledge to clinical practice, to include
  - Techniques to transfer the transverse horizontal hinge axis to an articulator
  - Occlusal errors that can result from errors in transferring the hinge axis to an articulator
  - The pantograph and its application
- Know the occlusal schemes most commonly used with gnathologic occlusal rehabilitation
- Know the various classifications of articulators and their application

### **Course Topics and Content:**

- Introduction
  - History of Gnathology
  - Goals of Course
  - Overview of Topics to be covered
  - Relevance to Prosthodontist
  - Literature on Topic
  - Future Use of Knowledge Learned in Course
- Anatomy Muscles of Mastication & TMJ
- Biomechanics of Mandibular Movement & Occlusal Morphology
- Gnathological Concepts & Techniques

- Transverse Horizontal Axis & Kinematic Face-bow
- Axis-Deviation/Occlusal Error Correlation
- Pantographic Tracing Techniques
- Gnathological Occlusion
  - Anterior & Posterior Guidance Factors
  - Types of Occlusal Schemes
  - Tripodal Posterior Occlusion
- Articulators

### **Assignments and Due Dates:**

Week:

Topic:

One	Introduction <ul style="list-style-type: none"> <li>-History of Gnathology</li> <li>-Goals of Course</li> <li>-Overview of Topics to be covered</li> <li>-Relevance to Prosthodontist</li> <li>-Literature on Topic</li> <li>-Future Use of Knowledge Learned in Course</li> </ul>
Two	Anatomy Muscles of Mastication & TMJ
Three	Biomechanics of Mandibular Movement & Occlusal Morphology
Four	Gnathological Concepts & Techniques <ul style="list-style-type: none"> <li>-Transverse Horizontal Axis &amp; Kinematic Face-bow</li> <li>-Axis-Deviation/Occlusal Error Correlation</li> <li>-Pantographic Tracing Techniques</li> </ul>
Five	Gnathological Occlusion <ul style="list-style-type: none"> <li>-Anterior &amp; Posterior Guidance Factors</li> <li>-Types of Occlusal Schemes</li> <li>-Tripodal Posterior Occlusion</li> </ul>
Six	Articulators
Seven	Exam

**Methods and Dates of Student Evaluations:** Course grade will be determined by performance on the final examination

**Teaching and Learning Methodologies:** Lecture and demonstration

**Course Text, Recommended Reading, Material, and Resources:** TBA

## **PR 821: Maxillofacial Prosthetics**

<b>Course Instructor:</b>	Dr. Nawaf AlDousari
<b>Office Hours:</b>	Sunday – Thursday 9:00 am to 4:00 pm
<b>Credit Hours:</b>	1
<b>Prerequisites:</b>	D.M.D., D. D.S. or equivalent
<b>Co-Requisites:</b>	None

**Course Description:** Maxillofacial Prosthetic Rehabilitation of acquired and congenital defects involving intraoral and extraoral prostheses, oral complication and management of sequelae of cancer radiation and chemotherapy, and the impact/restoration on form and function.

**Intended Learning Outcome:** The student will be familiar with the subspecialty of maxillofacial prosthetics involving all types, indications, contraindications, design, and materials of maxillofacial prostheses, and how maxillofacial prosthetics interfaces with head and neck surgery and radiation/chemotherapy for the care of these patients.

### **Course Topics and Content:**

- 1) Prosthetic rehabilitation of acquired and congenital defects of the head and neck especially the maxilla and mandible
- 2) Extraoral prostheses including ocular, orbital, nasal, and auricular prostheses.
- 3) Oral and prosthetic care of the head and neck irradiated, chemotherapeutic patients including associated sequelae.
- 4) Oral cancer and staging.
- 5) Speech and swallowing.

<u>Week:</u>	<u>Topics:</u>
One	Prosthetic rehabilitation of acquired and congenital defects of the head and neck especially the maxillae and mandible
Two	Prosthetic rehabilitation of acquired and congenital defects of the head and neck especially the maxillae and mandible (cont)
Three	Prosthetic rehabilitation of acquired and congenital defects of the head and neck especially the maxillae and mandible (cont)
Four	Prosthetic rehabilitation of acquired and congenital defects of the head and neck especially the maxillae and mandible (cont)

Five	Extraoral prostheses, ocular, orbital
Six	Extraoral prostheses, nasal, and auricular prostheses.
Seven	Extraoral prostheses, auricular
Eight	Oral and prosthetic care of the head and neck irradiated, chemotherapeutic patients including associated sequellae
Nine	Oral and prosthetic care of the head and neck irradiated, chemotherapeutic patients including associated sequellae (cont)
Ten	Oral and prosthetic care of the head and neck irradiated, chemotherapeutic patients including associated sequellae (cont)
Eleven	Oral and prosthetic care of the head and neck irradiated, chemotherapeutic patients including associated sequellae (cont)
Twelve	Oral cancer and staging.
Thirteen	Speech and swallowing.
Fourteen	Exam

**Assignments and Due Dates:** Course attendance and participation is required.

**Methods and Dates of Student Evaluations:** The final grade will be based on the final examination

**Teaching and Learning Methodologies:** Lecture and demonstration

**Course Text, Recommended Reading, Material, and Resources:** TBA

## **PR 855: Principles of Surgery for Prosthodontists**

<b>Course Instructor:</b>	Dr. Haneen Bokhadhoor
<b>Office Hours:</b>	Sunday – Thursday 9:00 am to 4:00 pm
<b>Credit Hours:</b>	1
<b>Prerequisites:</b>	D.M.D., D. D.S. or equivalent
<b>Co-Requisites:</b>	None

**Course Description:** The purpose of this course is to provide prosthodontic students with didactic and hands-on instruction in basic surgical principles and techniques to prepare the students for surgical placement of implants in some of their patients. Topics covered include:

**Intended Learning Outcome:** At the completion of this course the student will:

- Be familiar with fundamental surgical armamentarium
- Be able to describe surgical principles and guidelines
- Be able to describe various incision techniques
- Be able to describe the principles of flap design and management
- Be familiar with all commonly used suture materials and techniques
- Be able to provide post operative treatment for surgical patients, including management of complications
- Be able to perform straight, releasing and beveled incisions in simulation exercises on rubber dams, bananas, apples and pigs' heads
- Be able to elevate full-thickness and partial-thickness flaps and manage soft tissue in simulation exercises on pigs' heads
- Be able place single interrupted, figure-8, vertical mattress and horizontal mattress sutures in simulation exercises on pigs' heads

### **Course Topics and Content:**

#### Didactic instruction:

- Surgical armamentarium
- Surgical principles and guidelines
- Incisions
- Flap management
- Suturing (various materials and suturing techniques)
- Wound healing
- Post operative management of wounds and possible complications

Hands-on, simulation instruction:

- Various surgical incisions (straight, releasing, beveled) on rubber dams, bananas and apples
- Flap elevation, soft tissue management, full thickness/partial thickness flaps (pigs' heads)
- Suturing techniques: single interrupted, figure-8, vertical mattress, horizontal mattress.

**Assignments and Due Dates:** Attendance and participation in all lectures and simulation exercises is required

**Methods and Dates of Student Evaluations:** The final grade for this course will be based on:

- Performance in the simulation exercises (50 %)
- Full-time attendance (50 %)

**Teaching and Learning Methodologies:** Course attendance and participation is required.

**Course Text, Recommended Reading, Material, and Resources:**

- Ethicon Manual of Operative procedure and Surgical Knots
- Incision, flap development and Suturing material will be provided.

## **PR 861, 862, 863: Contemporary Prosthodontic Literature**

<b>Course Instructor:</b>	Dr. Nawaf AlDousari
<b>Office Hours:</b>	Sunday – Thursday 9:00 am to 4:00 pm
<b>Credit Hours:</b>	1
<b>Prerequisites:</b>	D.M.D., D. D.S. or equivalent
<b>Co-Requisites:</b>	None

**Course Description:** The purpose of this course is to introduce the Prosthodontic and Implantology students to the most recent (within the past 6 months) prosthodontic literature. This course will familiarize the students with a variety of primary prosthodontic journals, as well as secondary and tertiary journals. Various levels of scientific power within the literature will be investigated to highlight the depth, breadth and complexity of this relevant body of knowledge. Fostering of an attitude of “*life-long learning*” through regular, consistent reading of the literature is also a primary goal of this course.

All students (1<sup>st</sup>-, 2<sup>nd</sup>-, & 3<sup>rd</sup>- year students) in the Postdoctoral Prosthodontic program will be enrolled in the course, which will meet (alternating with PR 807, 808, 809 Patient Presentation and Treatment Planning Seminar) one Wednesday morning per month 8-9AM for a total of 15 1-hour class sessions. All students will be required to take this course each year throughout their educational program.

### **Intended Learning Outcome:**

- Expose students to current prosthodontic literature (published within the last 6 months)
- Expose students to a variety of prosthodontic journals with varying styles, research quality and scientific rigor
- Develop students’ ability to identify components of scientific article, *i.e.*, study design, variables, control, etc.
- Enable the students to integrate study design, biostatistics and outcomes in order to begin to practice determining relevance to prosthodontics
- Expose students to various uses of the literature in Prosthodontics: research, certification by the American Board of Prosthodontics, “evidence-based” clinical practice
- Facilitate students’ concept of *life-long learning* and the need for continued professional growth to remain current throughout their professional careers

**Course Topics and Content:** All students in the class will read 2 current prosthodontic articles from the literature prior to each class session to prepare for class discussion. These articles will be pre-selected and distributed to the students as photocopies or through e-mail in electronic format as attachments.

## **Assignments and Due Dates:**

Presentation in Class: Each of the 2 assigned-articles will be presented to the class by a student. The directors will randomly select a student to present each article and lead a discussion of various aspects of the article with the class. Each student should have an opportunity to present at least one time during the course. The following aspects of each article will be presented:

- a. type of representative study design
- b. brief explanation of methods and materials used
- c. independent and dependent variables
- d. category(ies) of data, such as, nominal, ordinal, interval, ratio
- e. brief explanation of statistical test(s) and appropriateness
- f. assessment of relative power of the study to the specialty with a range of *none-to-low-to-moderate-to-high*
- g. subjective opinion as assessment of relevance to Prosthodontic with an explanation

## **Methods and Dates of Student Evaluations:**

Class Attendance: (60% of total grade)  
4 points per class session X 15 classes = 40 points  
Attendance based on sign-in sheet

Student Presentation: (20% of total grade)  
20 points = read article and presented all aspects of study  
0 points = did NOT read article, unprepared to discuss material

Final Examination: (40% of total grade)  
20 points (e.g., 80% exam questions correct X 20 points = 16  
points toward final grade)

**Teaching and Learning Methodologies:** Instructor-guided, student-led literature review seminars

**Course Text, Recommended Reading, Material, and Resources:** Reading to be assigned from current literature

## **PR 901: Prosthodontic Literature Review**

<b>Course Instructor:</b>	Dr. Nawaf AlDousari
<b>Office Hours:</b>	Sunday – Thursday 9:00 am to 4:00 pm
<b>Credit Hours:</b>	4
<b>Prerequisites:</b>	DMD or equivalent
<b>Co-Requisites:</b>	None

**Course Description:** Current and classical prosthodontic literature as a basis for substantive discussion of concepts in therapy and research. Special emphasis is placed on the principles of evidence-based health care and critical review of the dental literature.

**Intended Learning Outcome:** This two-semester course is a seminar program that focuses on a variety of topics in prosthodontics. All second-year postdoctoral prosthodontic students participate in this course and attend the weekly meeting. Each four-hour, weekly meeting concentrates on a specific topic, and a group of previously assigned articles are critically evaluated. All students are required to review all assigned articles. After completion of this two-semester seminar program the student should:

- Have an historical perspective of the development of the specialty of prosthodontics and contemporary prosthodontic theories and techniques.
- Be familiar with the evolution of the dental literature from the early opinion papers to the modern scientific referred journal articles.
- Understand the concept of “evidence-based health care” and its role in clinical decision making.
- Be able to critically evaluate a journal article for scientific validity and clinical relevance.
- Be familiar with the use of modern library facilities and electronic databases for searching the scientific dental literature.
- Know the fundamental requirements for preparing a manuscript for publication.

### **Course Topics and Content:**

<u>Session</u>	<u>Topic</u>
1	Evidence-Based Health Care
2	Pontic Extensions (Cantilever Pontics)
3	Tooth Preparation Design
4	Die Relief
5	Impression Materials
6	Porcelain Laminate Veneers

7	Restoring Pulpless Teeth
8	Temporomandibular Disorders
9	Centric Relation
10	Articulators
11	Anterior Guidance
12	Clasping for RPDs (1)
13	Clasping for RPDs (2)
14	Guiding Planes
15	Osseointegrated Root-for Implants (1)
16	Osseointegrated Root-for Implants (2)

**Assignments and Due Dates:** Literature review preparation and participation in all classes is required. See the following reading lists

**Methods and Dates of Student Evaluations:** There is a take-home final examination. The final grade is determined by class participation and grade on the final examination.

**Teaching and Learning Methodologies:** Instructor-guided and student-led literature review seminars

**Course Text, Recommended Reading, Material, and Resources:** See the following course outlines for required reading lists.

## Format for Review of Articles: Research Reports

Purpose: What was the purpose of the investigation?

Materials and Methods: How was the study conducted, including the data analysis?

Results: What were the results of the investigation?

Discussion: Summarize the author's discussion of the results.

Conclusions: What conclusions can be drawn from the results?

Comments: In your own words critically review the article. What is the clinical relevance? Are there any weaknesses to the study or in the way it was reported? Are the conclusions justified on the basis of the data? What is your overall evaluation of the article?

## Format for Review of Articles that are not Reports of Original Research

Purpose: What is the purpose of this article? Is it a technique article, a Literature review, a clinical report, etc.?

Summary: Please summarize the contents of the article.

Comments: In your own words, critically review the article. What is the clinical relevance? Are there any weaknesses to the article (such as; obvious factual errors, poor organization, confusing writing style, inadequate objective information to substantiate strong opinions, etc.)? What is your overall evaluation of the article?

## Session 1

### Evidence-Based Health Care

- Sackett DL, Rosenberg WM, Gray JA, Haynes RB, Richardson WS. Evidence-based medicine: What is it and what it isn't. *Brit Med J.* 1996; 312:71-2
- Jacob RF, Carr AB. Hierarchy of research design used to categorize the "strength of evidence" in answering clinical dental questions.
- Kapur KK, Deupree R, Dent RJ, Hasse AL. A randomized clinical trial of two basic removable partial denture designs. Part 1: comparisons of five-year success rates and periodontal health. *J Prosthet Dent* 1994; 72:268-82.

*If Randomized Controlled Clinical Trials are the "Gold Standard" of Clinical Evidence, why aren't there more of the Studies in Prosthodontics?*

Valid standards of care need not be derived exclusively from randomized controlled clinical trials. If this were the case, prosthodontics, and many other disciplines of dentistry, would be almost devoid of any standards of care, to the detriment of our patients.

Evidence-based health care implies incorporating the best available external evidence into the decision-making process when making treatment decisions not the exclusive use of randomized controlled clinical trials when making treatment decisions. Clinical trials cannot be used if they do not exist. Consequently, accepted standards of health care are not based solely on randomized controlled clinical trials, but on all available evidence.

Randomized controlled clinical trials are best suited for relatively straight-forward and uncomplicated treatment interventions (such as an experimental antihypertensive medication) that can be compared to a standard treatment protocol (such as an established antihypertensive medication with known efficacy, the control) and when the outcome of interest is short-term results (Is the experimental medication as good as or better than the control medication at managing hypertension?). Even with this simple protocol, these studies are extremely expensive. The pharmaceutical industry in the US spends billions of US dollars annually on randomized controlled clinical trials.

Many questions or problems in health care are not well suited for randomized controlled clinical trials. Also, there are weaknesses to randomized controlled clinical trials. For example, small, controlled study groups measure efficacy (results under optimal conditions) not effectiveness (results under real-world conditions). Randomized controlled clinical trials cannot elicit long-term results under most study designs, and often the small patient population does not resemble the population at large, so relatively rare complications with treatment protocols are not discovered.

There are no randomized controlled clinical trials that prove that cigarette smoking causes or even contributes to health problems, and such a trial would be unethical. Studies on the negative health effects of cigarette smoking are primarily cohort studies or laboratory animal studies. Nevertheless even without this "gold standard", health-care workers routinely recommend that patients should not smoke cigarettes, and that those who do smoke should quit. Those health-care

providers who hold a different view (that there are no negative health effects related to cigarette smoking) would be considered lacking in current knowledge despite the lack of randomized controlled clinical trials on the subject.

Most studies in prosthodontics are cohort studies, case series or in vitro laboratory studies. As an example, there are no randomized controlled clinical trials of restored pulp teeth; however, there is still a substantial body of knowledge on this important area of clinical practice. An historical cohort study by Sorensen and Martinoff<sup>1</sup> investigated the failure rates of restored endodontically treated teeth (1273 teeth were included in the study). A number of variables were studied by Sorensen and Martinoff, such as lengths of the posts. Their study found a direct correlation between lengths of posts and success rates. Posts that were one-quarter the length of their respective clinical crowns experienced a 25% failure rate, whereas posts that equaled the length of the clinical crowns recorded a 2.5% failure rate—a ten-fold decrease. Although these data were not obtained from a randomized controlled clinical trial, they are relatively compelling nonetheless, and consistent with the findings of other studies. Do we really need a randomized controlled clinical trial to investigate this finding further? Would any new knowledge be gained? Would it be ethical to provide patients with posts that were too short and have been shown in this cohort study to fail 25% of the time? Because most of these failures would not occur soon after the restorations were placed, and because we are interested in long-term results, a randomized controlled clinical trial of this nature would have to extend for many years (perhaps 10 years) before we could obtain any meaningful data. How many drop-outs would occur over the ten-year period (patients who moved away, became ill, died or refused to return for follow-up)? Also, in the control group (where posts were designed to equal the lengths of their clinical crowns and where only a 2.5% failure rate could be expected), how many patients would be required to obtain meaningful data? Clearly, such an experiment would be prohibitively expensive, impractical and unethical. The funds available for research in health care are limited in any society, and it would be impossible to obtain funding for such a study. Cohort studies, especially historical cohort studies, can investigate large numbers of patients (Sorensen and Martinoff studied 1273 teeth), and results are available quickly.

Likewise, numerous in vitro fatigue studies of restored extracted endodontically treated teeth or tooth analogues as well as cohort studies have highlighted the importance of the ferrule effect, which is an important predictor of success of a restored pulpless tooth. A randomized controlled clinical trial investigating the efficacy of the ferrule would also be unethical because the group without the ferrule would be receiving a restoration known to have a higher failure rate. When well designed randomized controlled clinical trials are available, they should be regarded as the “gold standard” for answering clinical questions. There are very few in prosthodontics. The only randomized controlled clinical trial on clasp design for removable partial dentures was published by Kapur et al<sup>2</sup> and this article will be reviewed and discussed in the first session of the course. You might be surprised at the results.

1. Sorensen JA, Martinoff JT. Intracoronal reinforcement and coronal coverage: a study of endodontically treated teeth. *J Prosthet Dent* 1984; 51:780-784.
2. Kapur KK, Deupree R, Dent RJ, Hasse AL. A randomized clinical trial of two basic removable partial denture designs. Part I: Comparisons of five-year success rates and periodontal health. *J Prosthet Dent* 1994; 72:268-82.

## Session 2

### Pontic Extensions (Cantilever Pontics)

#### General Topic: Fixed Prosthodontics

- Schweitzer JM, Schweitzer RD, Schweitzer J. Free-end pontics used in fixed partial dentures. *J Prosthet Dent* 1968; 20:120-38.
- Randow K, Glantz PO. On cantilever loading of vital and non-vital teeth. A experimental clinical study. *Acta Odontol Scand* 1986; 44:271-7.
- Laurel L, Lundgren D. Interfering occlusal contacts and distribution of chewing and biting forces in dentitions with fixed cantilever prostheses. *J Prosthet Dent* 1987; 58:626-32.
- Strub JR, Linter H, Marinello CP. Rehabilitation of partially edentulous patients using cantilever bridges: A retrospective study. *Inter J Perio Rest Dent* 1989; 9:365-75.
- Awadalla RA, Azarbal M, Ismail YH, El-Ibiari W. Three dimensional finite element stress analysis of a cantilever fixed partial denture. *J Prosthet Dent* 1992; 68:243-8.

Hammerle CH, Ungerer MC, Fantoni PC, Bragger U, Burgin W, Lang NP. Long-term analysis of biologic and technical aspects of fixed partial dentures with cantilevers. *Int J Prosthodont* 2000; 13:409-15.

## Session 3

### Tooth Preparation Design

#### General Topic: Fixed Prosthodontics

- Jorgensen K. The relationship between retention and convergence angle in cemented veneer crowns. *Acta Odontol Scand* 1956; 13:35-40.
- Kaufman E, Coelho D, Colin L. Factors influencing the retention of cemented gold castings. *J Prosthet Dent* 1961; 11:487-502.
- Rosner D. Function, placement, and reproduction of bevels for gold castings. *J Prosthet Dent* 1963; 13:1160-6.
- Pascoe DF. Analysis of the geometry of finish lines for full crown restorations. *J Prosthet Dent* 1978; 40:57-62.
- Campagni WV, Wright W, Martinoff JT. Effect of die spacer on the seating of complete cast gold crowns with grooves. *J Prosthet Dent* 1986; 55:324-8.
- Edelhoff D, Sorensen JA. Tooth structure removal associated with various preparation designs for anterior teeth. *J Prosthet Dent* 2002; 87:503-9.

## Session 4

### Die Relief

#### General Topic: Fixed Prosthodontics

- Jorgensen KD. Structure of the film of zinc phosphate cements. *Acta Odontol Scand* 1960; 18:491-501.
- Fusayama T, Ide K, Hosoda H. Relief of resistance of cement of full crowns. *J Prosthet Dent* 1964; 14:95-106.
- Jorgensen KD, Esbensen AL. The relationship between the film thickness of zinc phosphate cement and the retention of veneer crowns. *Acta Odontol Scand* 1968; 26:169-75.
- Eames WB, O'Neal SJ, Moneiro J, Miller C, Roan Jr JD, Cohen KS. Techniques to improve the seating of castings. *JADA* 1978; 96:432-7.
- Marker VA, Miller AW, Miller BH, Swepston JH. Factors effecting the retention and fit of gold castings. *J Prosthet Dent* 1987; 57:425-30.
- Campbell SD. Comparison of conventional paint-on die spacers and those used with the all-ceramic restorations. *J Prosthet Dent* 1990; 63:151-5.

## Session 5

### Impression Materials

#### General Topic: Fixed Prosthodontics

- Ciesco JN, Malone WFP, Sandrik JL, Mazur B. Comparison of elastomeric impression materials used in fixed prosthodontics. *J Prosthet Dent* 1981; 45:89-94.
- Sneed WD, Miller R, Olson J. Tear strength of ten elastomeric impression materials. *J Prosthet Dent* 1983; 49:511-513.
- Johnson GH, Craig RG. Accuracy of four types of rubber impression materials compared with time of pour and repeat pour of models. *J Prosthet Dent* 1985; 53:484-90.
- de Araujo PA, Jorgensen KD, Finger W. Viscoelastic properties of setting elastomeric impression materials. *J Prosthet Dent* 1985; 54:633-6.
- de Araujo PA, Jorgensen KD. Effect of material bulk and undercuts on the accuracy of impression materials. *J Prosthet Dent* 1985; 54:791-4.
- Corso M, Abanomy A, DiCanzio J, Zurakowski D, Morgano SM. The effect of temperature changes on the dimensional stability of polyvinyl siloxane and polyether impression materials. *J Prosthet Dent* 1998; 79: 626-31.

## Session 6

### Porcelain Laminate Veneers

#### General Topic: Fixed Prosthodontics

- Horn HR. Porcelain laminate veneers bonded to etched enamel. *Dent Clin North Am* 1983; 27:671-84.
- Calamia JR. Etched porcelain veneers: the current state of the art. *Quintessence Int* 1985; 8:5-12.

- Highton R, Caputo AA, Matayas J. A photoelastic study of stresses on porcelain laminate preparations. *J Prosthet Dent* 1987; 58:157-61.
- Haywood VB, Heymann HO, Kusy RP, Whitley JQ, Andraus SB. Polishing porcelain veneers: An SEM and specular reflectance analysis. *Dent Mater* 1988; 4:116-21.
- Wall JG, Reisbeck ME, Jonson WM. Incisal-edge strength of porcelain laminate veneers restoring mandibular incisors. *Int J Prosthet Dent* 1992; 5:441-6.
- Castelnovo J, Tjan HL, Phillips K, Nicholls JI, Kois JC. Fracture load and mode of failure of ceramic veneers with different preparations. *J Prosthet Dent* 2000; 83:171-80.

## Session 7

### Restoring Pulpless Teeth

#### General Topic: Fixed Prosthodontics

- Baraban D. The restoration of pulpless teeth. *Dent Clin North Am* Nov 1967; 633-53.
- Sorenson JA, Matinoff JT. Intracoronal reinforcement and coronal coverage: A study of endodontically treated teeth. *J Prosthet Dent* 1984; 51:780-4.
- Sorenson JA, Matinoff JT. Clinically significant factors in dowel design. *J Prosthet Dent* 1984; 52:28-35.
- Morgano SM, Milot P. Clinical success of cast metal posts and cores. *J Prosthet Dent* 1993; 70:11-6.
- Morgano SM, Hashem AF, Fotoohi K, Rose L. A nationwide survey of contemporary philosophies and techniques of restoring endodontically treated teeth. *J Prosthet Dent* 1994; 72:259-67.
- Aquilino SA, Caplan DJ. Relationship between crown placement and the survival of endodontically treated teeth. *J Prosthet Dent* 2002; 87:256-63.

## Session 8

### Temporomandibular Disorders

#### General Topic: Temporomandibular Disorders

- Greene CS, Laskin DM. Splint therapy for myofascial pain-dysfunction (MPD) syndrome: A comparative study. *JADA* 1972; 84:624-8.
- Goodman P, Greene CS, Laskin DM. Response of patients with myofascial pain-dysfunction syndrome to mock equilibration. *JADA* 1976; 92:755-8.
- Greene CS, Olson DE, Laskin DM. Psychological factors in the etiology, progression, and treatment of MPD syndrome. *JADA* 1982; 105:443-8.
- Gabler MJ, Greene CS, Palacios E, Perry HT. Effect of arthroscopic temporomandibular joint surgery on articular disk position. *J Craniomandib Disord Facial Oral Pain* 1989; 3:191-202.
- McNeill C. Management of temporomandibular disorders: Concepts and controversies. *J Prosthet Dent* 1997; 77:510-22.

- Pullinger AG, Seligman DS. Quantification and validation of predictive values of occlusal variables in temporomandibular disorders using a multifactorial analysis. J Prosthet Dent 2000; 83:66-75.

## Session 9

### Centric Relation

#### General Topic: Occlusion

- Celenza FV. Centric Position: Replacement and character. J Prosthet Dent 1973; 30:591-98.
- Preston JD. A reassessment of the mandibular transverse horizontal axis theory. J Prosthet Dent 1979; 41:605-13.
- Mongini F. Condylar remodeling after occlusal therapy. J Prosthet Dent 1980; 43:568-77.
- Lucia VO. Modern gnathological concepts-updated. Chicago, Quintessence Publishing Co, Inc. 1983: Chapter 6 (Centric Relation) 83-107.
- Aquilino SA, Mattenson SR, Holland GA, Phillips C. Evaluation of condylar position from temporomandibular joint radiographs. J Prosthet Dent 1985; 53:88-97.
- McDevitt WE, Brady AP, Stack JP. A magnetic resonance imaging study of centric maxillomandibular relation. Int J Prosthodont 1995; 8:377-91.

## Session 10

### Articulators

#### General Topic: Occlusion

- Weinberg LA. An evaluation of basic articulators and their concepts. Part I. Basic concepts. J Prosthet Dent 1963; 13:622-44.
- Weinberg LA. An evaluation of basic articulators and their concepts. Part II. Arbitrary, positional, semiadjustable articulators. J Prosthet Dent 1963; 13:645-63.
- Weinberg LA. An evaluation of basic articulators and their concepts. Part III. Fully adjustable articulators. J Prosthet Dent 1963; 13:873-88.
- Weinberg LA. An evaluation of basic articulators and their concepts. Part IV. Fully adjustable articulators. J Prosthet Dent 1963; 13:1038-54.
- Teteruck WR, Lundeen HC. The accuracy of an ear facebow. J Prosthet Dent 1966; 16:1039-46.
- Lundeen HL, Wirth GC. Condylar movement patterns engraved in plastic blocks. J Prosthet Dent 1973; 30:866-75.

## Session 11

### Anterior Guidance

#### General Topic: Occlusion

- Gibbs CH, Lundeen HC. Jaw movements and forces during chewing and swallowing and their clinical significance. *Advances in occlusion*. Boston: John Wright-PSG Inc, 1982; 2-32.
- Williamson EH, Lundquist DO. Anterior guidance: Its effect on electromyographic activity in the temporal and masseter muscles. *J Prosthet Dent* 1983; 49:816-23.
- Dawson PE. Evaluation, diagnosis and treatment of occlusal problems. 2nd ed. St. Louis: CV Mosby, 1989; Chapter 16 (Anterior guidance); 274-97.
- Pellitier LB, Campbell SD. Evaluation of the relationship between anterior and posterior functionally disclusive angles. Part I: Literature review, instrumentation, and reproducibility. *J Prosthet Dent* 1990; 63:395-403.
- Pellitier LB, Campbell SD. Evaluation of the relationship between anterior and posterior functionally disclusive angles. Part II: Study of a population. *J Prosthet Dent* 1990; 63:536-40.
- Kerstein RB. Treatment of myofascial pain-dysfunction syndrome with occlusal equilibration. *J Prosthet Dent* 1990; 63:695-700.

## Session 12

### Clasping for RPDs (1)

#### General Topic: Removable Partial Prosthodontics

- Kratochvil FJ. Influence of occlusal rest position and clasp design on movement of abutment teeth. *J Prosthet Dent* 1963; 13: 114-24.
- Clayton JA, Jaslow C. A measurement of clasp forces on teeth. *J Prosthet Dent* 1971; 25: 21-43.
- Krol AJ. Clasp design for extension-base removable partial dentures. *J Prosthet Dent* 1973; 29: 408-15.
- Bensen D, Spolky VW. A clinical evaluation of removable partial dentures with I-bar retainers. *J Prosthet Dent* 1979; 41: 246-54.
- Tebrock OC, Rohen RM, Fenster RK, Pelleu GB. The effect of various clasping systems on the mobility of abutment teeth for distal-extension removable partial dentures. *J Prosthet Dent* 1979; 41: 511-6.
- Taylor DT, Pflughoeft FA, McGivney GP. Effect of two clasping assemblies on arch integrity as modified by base adaptation. *J Prosthet Dent* 1982; 47: 120-5

## Session 13

### Clasping for RPDs (2)

#### General Topic: Removable Partial Prosthodontics

- Cecconi BT, Asgar K, Dootz E. The effect of partial denture clasp design on abutment tooth movement. *J Prosthet Dent* 1971; 25: 44-56.

- Morris HF, Asgar K, Roberts EP, Brudvik JS. Stress-relaxation testing. Part II: Comparison of bending profiles, microstructures, microhardness, and surface characteristics of several wrought wires. *J Prosthet Dent* 1981; 46: 256-2.
- Brudvik JS, Morris HF. Stress-relaxation testing. Part III: Influence of wire alloys, gauges, and lengths on clasp behavior. *J Prosthetic Dent* 1981; 46: 374-9.
- Frank RP, Brudvik JS, Nicholls JJ. A comparison of the flexibility of wire and cast circumferential clasps. *J Prosthet Dent* 1983; 49: 471-6.
- Frank RP. Direct retainers for distal-extension removable partial dentures. *J Prosthet Dent* 1986; 56: 562-7.
- Hosman HJ. The influence of clasp design of distal extension removable partial dentures on the periodontium of the abutment teeth. *Int J Prosthodont* 1990; 3: 256-5.

## Session 14

### Guiding Planes

#### General Topic: Removable Partial Prosthodontics

- Rudd KD, O'Leary O. Stabilizing periodontally weakened teeth by using guide plane removable partial dentures. *J Prosthet Dent* 1966; 16: 721-7.
- Stern WJ. Guiding planes in clasp reciprocation and retention. *J Prosthet Dent* 1975; 34: 408-14.
- Frank RP, Nichols JJ. An investigation of the effectiveness of indirect retainers. *J Prosthet Dent* 1977; 38: 494-506.
- Berg T, Caputo A. Anterior rests for maxillary partial dentures. *J Prosthet Dent* 1978; 39: 139-46.
- Zarb GA, McKay HF. Cosmetics and removable partial dentures – The class IV partially edentulous patient. *J Prosthet Dent* 1981; 46: 360-8.
- McGivney GP, Castleberry DJ. Direct retainers (Chapter 6) in McCracken's Removable Partial Prosthodontics. Ninth edition. St Louis: CV Mosby; 1995: 81-126.

## Group 15

### Osseointegrated Root-form Implants (1)

#### General Topic: Implant Prosthodontics

- Zarb GA, Schmitt A. The longitudinal clinical effectiveness of osteointegrated dental implants: The Toronto Study. Part I: Surgical results. *J Prosthet Dent* 1990; 63: 451-7.
- Zarb GA, Schmitt A. The longitudinal clinical effectiveness of osteointegrated dental implants: The Toronto Study. Part II: The prosthetic results. *J Prosthet Dent* 1990; 64: 53-61.
- Zarb GA, Schmitt A. The longitudinal clinical effectiveness of osteointegrated dental implants: The Toronto Study. Part III: Problems and complications encountered. *J Prosthet Dent* 1990; 64: 185-94.
- Van Steenberghe D, Lekholm U, Bolender C, et al. The application of osseointegrated oral implants in the rehabilitation of partial edentulism: A prospective

- multicenter study on 558 fixtures. *Int J Oral Maxillofac Implants* 1990; 5: 272-81.
- Friberg B, Jemt T, Lekholm U. Early failures in 4,641 consecutively placed Branemark dental implants: A study from stage 1 surgery to the connection of completed prostheses. *Int J Oral Maxillofac Implants* 1991; 6: 142-6.
  - Bahat O. Treatment planning and placement of implants in the posterior maxillae: Report of 732 consecutive Nobelpharma implants. *Int Oral Maxillofac Implants* 1993; 8: 151-61.

## Session 16

### Osseointegrated Root-form Implants (2)

#### General Topic: Implant Prosthodontics

- Hebel KS, Gajjar RC. Cement-retained versus screw-retained implant restorations: achieving optimal occlusion and esthetics in implant dentistry. *J Prosthet Dent* 1997; 77:28-35.
- Weber HP, Cochran DL. Soft tissue response to osseointegrated dental implants. *J Prosthet Dent* 1998; 79:79-89.
- Cooper LF. A role for surface topography in creating and maintaining bone at titanium endosseous implants. *J Prosthet Dent* 2000; 84:522-34.
- Sahiwal IG, Woody RD, Benson BW, Guillen GE. Radiographic identification of threaded endosseous dental implants. *J Prosthet Dent* 2002; 87:563-77.
- Taylor TD, Agar JR. Twenty years of progress in implant prosthodontics. *J Prosthet Dent* 2002; 88:89-95.
- Goodacre CJ, Bernal G, Rungcharassaeng K, Kan JYK. Clinical complications with implants and implant prostheses. *J Prosthet Dent* 2003; 90:121-32.

## **PR 911, 912, 913: Clinical Prosthodontics**

**Course Instructor:** Dr. Nawaf AlDousari

**Office Hours:** Sunday – Thursday 9:00 am to 4:00 pm

**Credit Hours:** 6 credits, 1st and 2nd semester;  
12 credits, 3rd, 4th, 5th and 6th semester.

**Prerequisites:** To enter PR 911, the student must successfully complete all requirements for PR 815 Basic Prosthodontic Techniques and receive a grade of C or better. To enter PR 912, the student must successfully complete all requirements for PR 911 and receive a grade of C or better. To enter PR 913, the student must successfully complete all requirements for PR 912 and receive a grade of C or better.

**Co-Requisites:** None

**Course Description:** PR 911, 912, 913 is a three-year course in the clinical practice of Prosthodontic that includes advanced clinical and laboratory experiences in all phases of complex fixed, removable and implant Prosthodontic under direct supervision of the prosthodontic faculty.

**Intended Learning Outcome:** At the completion of this three-year clinical course the student will attain knowledge and skills representative of a clinician proficient in the specialty of Prosthodontics. At the completion of this three-year course the student will:

- Possess advanced knowledge and skills at the level of a specialist in comprehensive treatment planning
- Possess advanced knowledge and skills at the level of a specialist in fixed prosthodontics
- Possess advanced knowledge and skills at the level of a specialist in removable Prosthodontics
- Possess advanced knowledge and skills at the level of a specialist in implant Prosthodontics
- Possess advanced knowledge and skills at the level of a specialist in comprehensive patient management
- Possess advanced knowledge and skills at the level of a specialist of contemporary prosthodontic materials and techniques
- Be competent in dental laboratory procedures for the care of a wide variety of prosthodontic patients

**Course Topics and Content:** This is the clinical portion of the prosthodontic program. Students are assigned patients for prosthodontic consultation, diagnosis and treatment. The Program Coordinator is responsible for patient assignment.

**Assignments and Due Dates:** Students are expected to be in the clinical facility on all assigned days. If a student has no assigned patient for a specific clinic session he or she is expected to assist a classmate in patient care.

**Methods and Dates of Student Evaluations:** All faculty evaluate the students semi-annually. The final grade for each year will be based on the semi-annual faculty evaluations.

**Teaching and Learning Methodologies:** Mentored clinical patient care

**Course Text, Recommended Reading, Material, and Resources:** No required text for this course.

## **PR 918: Student Teaching**

<b>Course Instructor:</b>	Dr. Nawaf AlDousari
<b>Office Hours:</b>	Sunday – Thursday 9:00 am to 4:00 pm
<b>Credit Hours:</b>	1
<b>Prerequisites:</b>	Successful completion of PR 911, PR 912: Clinical Prosthodontics
<b>Co-Requisites:</b>	None

**Course Description:** This course is designed to allow students to have the opportunity to synthesize their knowledge and experience through involvement with limited, supervised teaching assignments. During July, August and September first-year students take PR 815 (Basic Prosthodontic Techniques), a preclinical laboratory simulation course. All third-year students will assist the course director in providing hands-on instruction to the first-year students in: tooth preparations for fixed restorations, complete-mouth waxing techniques, provisionalization, complete denture techniques, use of semi-adjustable articulators with face-bow, methods of recording centric relation, occlusal splint fabrication, fabrication of cast gold and metal ceramic restorations, basic techniques for implant prosthodontics, post-core restorations, and simulated clinical and laboratory procedures for porcelain laminate veneers.

### **Intended Learning Outcome:**

At the completion of this course students should:

- Have improved knowledge and understanding of the topics listed below.
- Have an understanding of the process of developing and managing a simulation laboratory course for postdoctoral students in prosthodontics.
- Develop expertise in the teaching of basic prosthodontic techniques to neophytes.

**Course Topics and Content:** This teaching assignment will require students to provide hands-on instruction to first-year students, under direct supervision of the course director, in the following topics:

- tooth preparations for fixed restorations,
- complete-mouth waxing techniques,
- provisionalization,
- complete denture techniques,
- use of semi-adjustable articulators with face-bow,
- methods of recording centric relation,
- occlusal splint fabrication,
- fabrication of cast gold and metal ceramic restorations,
- basic techniques for implant prosthodontics,
- post-core restorations,
- simulated clinical and laboratory procedures for porcelain laminate veneers.

**Assignments and Due Dates:** The course director will prepare individual schedules for each student. During the months of July, August and September, each third-year student will be assigned to teach for a minimum of 10 half-day sessions.

**Methods and Dates of Student Evaluations:**

- Attendance: 50 %
- Teaching effectiveness based on a survey of the first-year students' experiences with each third-year student (conducted at the conclusion of the course): 50 %

**Teaching and Learning Methodologies:** Hands-on, one-on-one instruction, including demonstrations.

**Course Text, Recommended Reading, Material, and Resources:**

- Departmental manual for this course (supplied to students).
- Shillingburg HT, Jacobi R, Brackett SE. Fundamentals of tooth preparations. Chicago: Quintessence Inc., 1998

## **PR 991, 992, 993: Research Prosthodontics**

<b>Course Instructor:</b>	Dr. Nawaf AlDousari / Faculty
<b>Office Hours:</b>	Sunday – Thursday 9:00 am to 4:00 pm
<b>Credit Hours:</b>	1 credit, 1st and 2nd semester; 3 credits, 3rd and 4th semester; 4 credits, 5th and 6th semester.
<b>Prerequisites:</b>	DMD or equivalent
<b>Co-requisites:</b>	PR 803: Biostatistics and OB 830: Research Writing

**Course Description:** This course involves an approved investigative effort to satisfy requirements for the MSD degree. Research may involve preclinical and clinical subjects related to prosthodontics or restorative dentistry. Students must complete a research project, thesis and thesis defense to fulfill the requirements of this course.

### **Intended Learning Outcome:**

At the completion of this course students should:

- Have improved knowledge and understanding of evidence-based dentistry.
- Have an understanding of the process of developing and managing a research project.
- Be able to statistically analyze data generated from a research project.
- Have an understanding of the process of developing an acceptable thesis on a research project.

### **Course Topics and Content:**

The research mentor will prepare individual schedules for each student with due dates for:

- Protocol,
- Completion of pilot study or studies,
- Completion of all experiments,
- Completion of data analysis,
- First draft of the thesis,
- Final draft of the thesis,
- Thesis defense.

### **Assignments and Due Dates**

- The student will develop a protocol for a research project that includes:
  - Introduction and comprehensive literature review on the topic of the investigation,

- Statement of the problem,
- Purpose of the investigation,
- Proposed materials and methods,
- The student will then conduct a pilot study or pilot studies and make modifications to the materials and methods as indicated by the pilot study or studies.
- The student will conduct the actual experiments and collect data.
- Data will be statistically analyzed.
- The student will prepare a thesis for review by the thesis review committee.
- The student will present and defend the thesis for the thesis defense committee.

### **Methods and Dates of Student Evaluations:**

The final grade is based on:

- Quality of the research conducted, including the experimental design and the execution of the experiments,
- Quality of the thesis,
- Ability to defend the thesis in an oral presentation to the thesis defense committee.

A grade will be awarded each year. It is generally expected that the student will have developed a research topic and done a literature review by the end of the first year, made substantial progress on the research by the end of the second year and have written and defended a thesis by April of the third year.

Once the thesis defense is completed (the date will vary from student to student) the third year grade will be recorded and submitted to the registrar.

**Teaching and Learning Methodologies:** Students are mentored by a research mentor for all steps listed in Course Topics and Content

### **Course Text, Recommended Reading, Material, and Resources:**

Reading assignments will be determined for each student on an individual basis based on the research topic.