



KING SAUD UNIVERSITY
College of Dentistry

Department of Restorative Dental Sciences
DIVISION OF ENDODONTICS

COURSE OUTLINE

323 RDS

Pre-Clinical Endodontics
Three (3) Credit Hours
Third Year
2014-2015

Prepared by Prof. Abdulhamied Saad

Course Director – 323 RDS (BUC)

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Course Director – 323 RDS (GUC)

I. COURSE PROSPECTIVE

323 RDS scope is introducing endodontics to third year dental students. The course was designed for the student to understand the variable anatomy of root canal systems, execute non-surgical endodontic treatment on anterior and posterior teeth. In order to provide the students with the necessary knowledge, the course will have two main components:

1. **Classroom lecture series**, which will cover the scope of endodontics, non-surgical root canal treatment
2. **Laboratory exercises** to practice endodontic treatment on extracted human teeth, which are mounted in a dent-form to simulate clinical scenario.

II. COURSE OBJECTIVES

Based on the content of the lecture series, laboratory exercises, and recommended reading material, at the end of this course the student should be able to:

1. Demonstrate clear understanding of the morphology of the Root canal anatomy.
2. Understand the basic theoretical and biological principles of variable endodontic clinical procedure.
3. Carry out fundamental operative procedures in endodontics.
4. Recognize the dental materials and instruments used in endodontics.
5. Recognize the anatomical differences between posterior and anterior teeth during access cavity preparation.
6. Students will learn how to contribute and work in a team to finish the assigned projects.

III. COURSE REQUIREMENTS

1. Students must attend all the lectures and lab sessions. Absences will be reported to the administration when it reaches 25% or above.
2. Human extracted teeth will be used in this course.
 - a. The teeth must be clean, free of debris and preferably have sound crown or with minimum caries destruction.
 - b. The pulp chamber and canals must be accessible as confirmed by radiographs (teeth with immature apices, calcified canals, severely curved canals, previous root canal treatment, external or internal root resorption, or with too short or too long root **should not be used**).
 - c. The selected teeth should be stored in a jar containing 0.9% physiological saline until mounted.
 - d. All the required teeth (2 anteriors, 3 premolars and 4 molars) must be mounted in acrylic using the rubber mould.
 - e. Additional teeth (2 anteriors, 2 premolars, 3 molars) with inappropriate root morphology (as confirmed by radiographs) should be mounted **individually** in plaster of paris blocks for the purpose of access opening and other practical exercises.
 - f. Between the practical sessions, the mounted teeth should be covered with gauze pads soaked with saline solution and kept in a sealed container to ensure 100% humidity and prevent tooth cracking during instrumentation and obturation.
3. At the end of the first half of the course, the student must have finished:
 - a. Root canal therapy on two anterior teeth or one anterior and lower premolar with single canal.
 - b. Root canal therapy on two premolar (including one with two canals) teeth.
 - c. Access openings on one anterior tooth and two premolar teeth including one with two canals) mounted individually in plaster.
 - d. The fourth anterior tooth mounted in acrylic should be saved for *midterm practical exam*.
 - e. Instrument spotting exam will be carried out as the *first laboratory assessment*.

4. At the end of the second half of the course, the student must have finished:
 - a. Root canal therapy on three molar (upper and lower) teeth .
 - b. Access openings on two molars (one maxillary and one mandibular) mounted individually in plaster.
 - c. Retreatment, and Ca(OH)₂ application on a previously obturated single rooted tooth.
 - d. Post space preparation on a previously obturated canal.
 - e. Three teeth (an anterior, a premolar, and a molar) should be saved for *the second laboratory assessment*.
 - d. The fourth molar should be saved for *final practical exam* (upper or lower).
5. At the end of each laboratory session students must have their instructor sign their finished assignment before they leave.
6. Each finished case must be evaluated in 323 RDS Course Book and documented in the endodontic form (envelope) , **within the same week**. Delayed submissions will be marked down.
 - a. The endodontic form must be completed (e.g. student's name, serial number, university number, tooth number, working length, size of MAF – etc.)
 - b. The radiographs of the finished case must be mounted, dated and submitted in the endodontic form (preoperative, working length, master apical file, master gutta percha point, final ± intermediate).

IV. READING TEXTBOOK:

- **Cohen’s Pathway of The Pulp**, 10th edition. Kenneth M. Hargreaves. **Hard copy/ print.**
- **Practical Lessons in Endodontic Treatment.** Donald E. Arens. **Hard copy/ print.**
- **Textbook of Endodontology**, 2nd edition. Gunner Bergenholtz. **Soft copy/ PDF online.**

V. COURSE ASSESSMENT

	Task	Percentage
1	Midterm Exam	10%
2	Final Written Exam	30%
3	Practical Assessment	20%
4	Projects (Poster, Demo, Scientific writing)	10%
5	Daily Lab Project	30%

PRE-CLINICAL ENDODONTICS – 323 RDS
Tuesday (01:00- 02:00 p.m.) BUC
Academic year 2014-2015

BUC LECTURE SCHEDULE

Lecture Topic	Week	Date	Speaker
I. Introduction to Endodontics The Definition & Scope of Endodontics	1	02 Sept 14	
Endodontic Preparation	2	09 Sept 14	
Maxillary & Mandibular Anterior Teeth	3	16 Sept 14	
II. Endodontic Procedures: Part 1 Instrumentation Techniques	4	14 Oct 14	
Materials & Methods of Obturation	5	21 Oct 14	
III. Posterior Teeth Morphology & Access Preparation Maxillary & Mandibular Premolar teeth	6	28 Oct 14	
Coronal Flaring & Working Length	7	04 Nov 14	
Maxillary & Mandibular Molar teeth	8	18 Nov 14	
IV. Endodontic Procedures: Part 2 Clinical Endodontic Treatment	9	25 Nov 14	
Procedural Mishaps: Prevention & Management	10	02 Dec 14	
Materials & Methods of Post Removal & Root Canal Filling Material	11	09 Dec 14	
V. Endodontology The Dentin Pulp Complex: Structure, Function & Response to Adverse Influences	12	16 Dec 14	
Microbiology of The Necrotic Pulp	13	23 Dec 14	
Apical Periodontitis	14	31 Dec 14	

PRE-CLINICAL ENDODONTICS – 323 RDS
Sunday (08:00- 09:00 a.m.) GUC
Academic year 2014-2015

GUC LECTURE SCHEDULE

Lecture Topic	Week	Date	Speaker
I. Introduction to Endodontics The Definition & Scope of Endodontics	1	31 Aug 14	
Endodontic Preparation	2	07 Sept 14	
Maxillary & Mandibular Anterior Teeth	3	14 Sept 14	
II. Endodontic Procedures: Part 1 Instrumentation Techniques	4	21 Sept 14	
Materials & Methods of Obturation	5	12 Oct 14	
III. Posterior Teeth Morphology & Access Preparation Maxillary & Mandibular Premolar teeth	6	19 Oct 14	
Coronal Flaring & Working Length	7	26 Nov 14	
Maxillary & Mandibular Molar teeth	8	09 Nov 14	
IV. Endodontic Procedures: Part 2 Clinical Endodontic Treatment	9	16 Nov 14	
Procedural Mishaps: Prevention & Management	10	23 Nov 14	
Materials & Methods of Post Removal & Root Canal Filling Material	11	30 Nov 14	
V. Endodontology The Dentin Pulp Complex: Structure, Function & Response to Adverse Influences	12	07 Dec 14	
Microbiology of The Necrotic Pulp	13	14 Dec 14	
Apical Periodontitis	14	21 Dec 14	

PRE-CLINICAL ENDODONTICS – 323 RDS

Tuesday (02:00- 04:30 p.m.) BUC

Sunday (09:00- 11:30 a.m.) GUC

Academic year 2014-2015

1st Semester Laboratory Sessions	Week
1. Teeth Selection: Orientation with the lab facilities, teeth selection .	1
Teeth selection and radiographs.	2
Teeth selection and mounting in dent-form	3
2. Anterior Endodontic Treatment: Access cavity of 2 anterior teeth . Maxillary and mandibular.	4
Access cavity & instrumentation of an anterior tooth.	5
Obturation.	6
3. Premolar (1 canal) Endodontic Treatment: Access cavity & instrumentation of a premolar.	7
Obturation.	8
4. Single Visit Endodontics: Access cavity, instrumentation, obturation in tooth with a single canal.	9
Practical Assessment I	10
Midterm Practical Exam	11
5. Premolar (2 canals) Endodontic Treatment: Access cavity of 2 premolars . Maxillary and mandibular.	12
Access cavity & instrumentation of a premolar.	13
Obturation.	14

2nd Semester Laboratory Sessions	Weeks
6. Premolar (2 canals) Endodontic Treatment: Access cavity & instrumentation of a premolar.	1
Obturation.	2
Practical Assessment II part 1. Access cavity and instrumentation of a premolar.	3
Practical Assessment II part 2. Complete instrumentation and obturation.	4
7. Introduction to Molar Endodontics Access cavity of 2 molars . Maxillary and mandibular.	5
Access cavity of a molar.	6
Instrumentation.	7
Obturation.	8
8. Practice Molar Endodontics Access cavity & instrumentation of a molar.	9
Instrumentation & Obturation	10
Access Cavity & instrumentation of a molar.	11
To be announced.	12
9. Final Practical Exam Final Practical Exam part 1. Access cavity and instrumentation of a molar.	13
Final Practical Exam part 2. Complete instrumentation and obturation.	14

CONTENTS OF THE LECTURES

Introduction to Endodontics

The Definition & Scope of Endodontics

- Definition Of Endodontology & Endodontics
- Rational Of Endodontic Treatment
- Endodontics In Treatment Plan

Reference: course director note

Endodontic Preparation: Isolation, Magnification, Instruments & Irrigation

- Guidelines For Rubber Dam Use
- Value Of Magnification
- Endodontic Instruments And Equipment
- Root Canal Instruments And Irrigation

References:

- Practical Lessons in Endodontic Treatment by Arens, Gluskin, C. Peters, O, Peteres.
Lesson 11, 13, 15, 17 & 18

Maxillary & Mandibular Anterior Teeth

- Root Canal Morphology
- Access Cavity: Outline, Guidelines
- Mishaps: Prevention, Diagnosis, Mangement

References:

- Cohen's Pathways of the pulp 10th edition. **Chapter 7.**
- Practical Lessons in Endodontic Treatment by Arens, Gluskin, C. Peters, O, Peteres.
Lesson 16.

Endodontic Procedures: Part 1

Instrumentation Techniques

- Hand Instrumentation
- Nickel Titanium Rotary Instruments
- Shaping & Cleaning The Anatomically Uncomplicated & Complicated Canals
- Locating & Opening The Mineralized Canals

References:

- Textbook of Endodontology, 2nd edition by Gunner Bergenholtz. **Chapter 11, (184-188).**
- Practical Lessons in Endodontic Treatment by Arens, Gluskin, C. Peters, O, Peteres.
Lesson 20, 21 & 22.

Materials & Methods of Obturation

- Objectives Of Obturation
- Sealers & Solid Core Materials
- Methods Of Obturations
- Challenges & Mishaps In Obturation

References:

- Textbook of Endodontology, 2nd edition by Gunner Bergenholtz. **Chapter 13.**
- Practical Lessons in Endodontic Treatment by Arens, Gluskin, C. Peters, O, Peteres.
Lesson 30, 31 & 34.

Posterior Teeth Morphology & Access Preparation

Maxillary & Mandibular Premolar Teeth

- Root Canal Morphology
- Access Cavity: Outline, Guidelines
- Mishaps: Prevention, Diagnosis, Management

References:

- Cohen's Pathways of the pulp 10th edition. **Chapter 7.**
- Practical Lessons in Endodontic Treatment by Arens, Gluskin, C. Peters, O, Peteres.

Lesson 16

Coronal Flaring & Working Length

- Anatomy Of The Root Canal System
- Methods To Establish Working Length
- Coronal Preflaring

References:

- Textbook of Endodontology, 2nd edition by Gunner Bergenholtz. **Chapter 11, (169-180).**

Maxillary & Mandibular Molar Teeth

- Root Canal Morphology
- Access Cavity: Outline, Guidelines
- Mishaps: Prevention, Diagnosis, Management

References:

- Cohen's Pathways of the pulp 10th edition. **Chapter 7.**
- Practical Lessons in Endodontic Treatment by Arens, Gluskin, C. Peters, O, Peteres.

Lesson 16.

Endodontic Procedures: Part 2

Clinical Endodontics Treatment

- Clinical Infection Control
- Advance In Endodontic Instruments
- Endodontic Radiographs
- Temporary Restoration

References:

- Cohen's Pathways of the pulp 10th edition. **Chapter 8.**
- Practical Lessons in Endodontic Treatment by Arens, Gluskin, C. Peters, O, Peteres.
Lesson 3, 12 & 28

Procedural Mishaps: Prevention & Management

- Mishaps During Root Canal Shaping
- Mishaps In Shaping The Apical Third
- Preventing Procedural Mishaps

References:

- Practical Lessons in Endodontic Treatment by Arens, Gluskin, C. Peters, O, Peteres.
Lesson 24 & 25.
Textbook of Endodontology, 2nd edition by Gunner Bergenholtz. **(188-190)**

Material & Methods of Post Removal and Root Canal Filing Material

- Coronal Access Cavity Preparation
- Post Removal
- Regaining Access To The Apical Area

References:

- Cohen's Pathways of the pulp 10th edition. **Chapter 25. (899-914)**

Endodontology

The Dentin Pulp Complex: Structure, Functions & Response to Adverse Influences

- Constituent & Normal Functions Of The Dentin Pulp Complex
- Appropriate Responses Of The Healthy Pulp To Non-Destructive Stimuli
- Responses To Restorative Procedure
- Effects Of Potentially Destructive Stimuli

References:

Textbook of Endodontology, 2nd edition by Gunner Bergenholtz. **Chapter 2 (11-29).**

Microbiology of The Necrotic Pulp

- Routes Of Microbial Entry To The Pulp Space
- Modes Of Colonization
- Ecological Determinants For Microbial Growth In Root Canals
- Composition Of The Endodontic Microfilm
- Association Of Sign & Symptoms With Specific Bacterial

References:

Textbook of Endodontology, 2nd edition by Gunner Bergenholtz. **Chapter 6 (96-110).**

Apical Periodontitis

- Evidence For The Essential Role Of Microorganisms In Apical Periodontitis
- The Nature Of Apical Periodontitis
- Interaction With The Infecting Microbiota
- Clinical Manifestation & Diagnostic Terminology

References:

Textbook of Endodontology, 2nd edition by Gunner Bergenholtz. **Chapter 7 (117-126) & pages 95, 96.**

