

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**

**2015-2016**

**Prepared by Prof. Abdulhamied Saad**

**Course Director – 323 RDS (BUC)**

**Updated by Reem Siraj Alsuliamani, MSc.**

**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.

1. 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***.

1. 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).

1. At the end of each laboratory session students must have their instructor sign their finished assignment before they leave.
2. Each finished case must be evaluted 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

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| --- | --- | --- |
|  | **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**

**Sunday (08:00- 09:00 a.m.) GUC**

**Academic year 2014-2015**

**GUC LECTURE SCHEDULE**

|  |  |  |  |
| --- | --- | --- | --- |
| **Lecture Topic** | **Week** | **Date** | **Speaker** |
| 1. **Introduction to Endodontics**   The Definition & Scope of Endodontics | 1 | 23 Aug 15 | R. Alsulamani |
| Endodontic Preparation | 2 | 30 Aug 15 | R. Alsulamani |
| Maxillary & Mandibular Anterior Teeth | 3 | 06 Sept 15 | R. Alsulamani |
| 1. **Endodontic Procedures: Part 1**   Coronal Flaring & Working Length | 4 | 13 Sept 15 | R. Alsulamani |
| Instrumentation Techniques | 5 | 04 Oct 15 | B. Alnashmi |
| Materials & Methods of Obturation | 6 | 11 Oct 15 | R. Alsulamani |
| 1. **Posterior Teeth Morphology & Access Preparation**   Maxillary & Mandibular Premolar teeth | 7 | 18 Oct 15 | S. Alsubait |
| Maxillary & Mandibular Molar teeth | 8 | 25 Oct 15 | R. Alsulamani |
| 1. **Endodontic Procedures: Part 2**   Clinical Endodontic Treatment | 9 | 08 Nov 15 | R. Alsulamani |
| Procedural Mishaps: Prevention & Management | 10 | 15 Nov 15 | R. Alsulamani |
| Materials & Methods of Post Removal & Root Canal Filling Material | 11 | 22 Nov 15 | K. Almanie |
| 1. **Endodontology**   The Dentin Pulp Complex: Structure, Function & Response to Adverse Influences | 12 | 29 Nov 15 | R. Alsulamani |
| Microbiology of The Necrotic Pulp | 13 | 06 Dec 15 | R. Alsulamani |
| Apical Periodontitis | 14 | 13 Dec 15 | R. Alsulamani |

**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**

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| **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** |
| 1. **Anterior Endodontic Treatment:**   Access cavity of 2 anterior teeth. Maxillary and mandibular. | **4** |
| Access cavity & instrumentation of an anterior tooth. | **5** |
| Obturation. | **6** |
| 1. **Premolar (1 canal) Endodontic Treatment:**   Access cavity & instrumentation of a premolar. | **7** |
| Obturation. | **8** |
| 1. **Single Visit Endodontics**:   Access cavity, instrumentation, obturation in tooth with a single canal. | **9** |
| **Practical Assessment I** | **10** |
| **Midterm Practical Exam** | **11** |
| 1. **Premolar (2 canals) Endodontic Treatment:**   Access cavity of 2 premolars. Maxillary and mandibular. | **12** |
| Access cavity & instrumentation of a premolar. | **13** |
| Obturation. | **14** |

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| --- | --- |
| **2nd Semester Laboratory Sessions** | **Weeks** |
| 1. **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** |
| 1. **Introduction to Molar Endodontics**   Access cavity of 2 molars. Maxillary and mandibular. | **5** |
| Access cavity of a molar. | **6** |
| Instrumentation. | **7** |
| Obturation. | **8** |
| 1. **Practice Molar Endodontics**   Access cavity & instrumentation of a molar. | **9** |
| Instrumentation & Obturation | **10** |
| Access Cavity & instrumentation of a molar. | **11** |
| **To be announced.** | **12** |
| 1. **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 Magnfication
* 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**

**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).**

**Instrumentation Techniques**

* Hand Instrumentation
* Nickle Titanium Rotary Instruments
* Shaping & Cleaning The Anatomically Uncomplicated & Complicated Canals
* Locating & Opening The Minerlized 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, 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**

**Maxillary & Mandibular Molar 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 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 Responces Of The Healthy Pulp To Non-Destructive Stimuli
* Responces 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 Manifisation & Diagnostic Terminology

**References:**

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