King Saud University, College of Dentistry

Department of Pediatric Dentistry and Orthodontics

Graduate Program in Orthodontics

Orthodontic Biomaterials/Treatment Mechanics

Second Semester, Academic Year 2016/2017 G [1437-1438 H]

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| **Course Code and Number:** | PDS 540 (Orthodontic Seminar I) | | | |
| **Course Name:** | Orthodontics Biomaterials/Treatment Mechanics | | | |
| **Pre-Requisites:** | None | | | |
| **Course Level:** | Offered in the 2nd Semester of the 1st Year to the Graduate Students | | | |
| **Room:** | Orthodontic Seminar room | | | |
| **Time:** | Wednesday, 10:00-12:00 am | | | |
| **Dates:** | February 8 – May 24, 2017 | | | |
|  | | | | |
| **Course Director:** | **Office Hours** | **Office Location** | **Telephone** | **E-mail** |
| Dr. Nabeel Talic | 11:00-12:00 pm  Tuesday | 2A/11A | 77223 | nftalic@yahoo.com |

***COURSE DESCRIPTION:***

The course covers two aspects:

1. Techniques for studying materials, structure and properties of orthodontic wires and brackets, elastomeric ligatures and chains, adhesive resins and cements, and impression materials, in addition to orthodontic bonding to conventional and non-conventional surfaces, and the biocompatibility of different orthodontic materials.
2. Introduction to the laws of mechanics and the typical tissue responses to force systems used in orthodontic appliances. In addition to the concept "system equilibrium", the implications for planning orthodontic anchorage, the mechanics of headgear designs, biomechanical approaches to the management of vertical occlusal issues, and the biomechanical principles of molar control in the transverse and anterior-posterior direction.

***CREDIT/CONTACT HOURS:***

This course is offered as part of the “PDS 540-Orthodontic Seminar I” course which has 5 credit hours. The course “Orthodontic Biomaterials/Treatment Biomechanics” is given over 2 contact hours per week.

***STUDY PLAN AND REQUIREMENTS:***

To receive the maximum benefit from this course, the student must attend all seminars.

A large emphasis of this course is placed on the careful review and discussion of the selected references. All students must read the articles/chapters under discussion.

***COURSE FORMAT:***

* Lectures
* Literature review
* Group discussion
* Hands-on

***REFERENCES:***

**Orthodontic Materials: Scientific and Clinical Aspects**

William A. Brantley, Theodore Eliades

1st Edition, 2001, Thieme, Stuttgart

**Biomechanics and Esthetic Strategies in Clinical Orthodontics**

Ravindra Nanda

2005, Elsevier Inc.

*Additional Reading:*

***Common Sense Mechanics in Everyday Orthodontics II***

Thomas F. Mulligan

1st Edition, 2012, CSM Publishing, Phoenix

***METHODS OF ASSESSMENT:***

* Attendance (5%)
* Participation (10%)
* Literature review presentation evaluation (20%)
* Midterm examination (25%)
* Final written examination (40%)

***READING ASSIGNMENTS:***

1. *March 15, 2017:*

* *Orthodontic Materials: Scientific and Clinical Aspects.*

*Chapter 4*

1. *March 22, 2017:*

* *Orthodontic Materials: Scientific and Clinical Aspects.*

*Chapter 8*

1. *March 29, 2017:*

* *(a) Rogers S. et. al. Fluoride-containing orthodontic adhesives and decalcification in patients with fixed appliances: A systematic review. Am J Orthod. Dentofacial Orthop. 2010; 138: 390.e1–390.e8*

# (b) Benson B. Systematic review of glass-ionomer adhesives. Am J Orthod. Dentofacial Orthop.2011; 147

* *(c) Fleming P. et. al. Self-etch primers and conventional acid-etch technique for orthodontic bonding: A systematic review and meta-analysis. Am J Orthod. Dentofacial Orthop. 2012; 142:83-94*
* *(d) Fleming P. et. al. Curing lights for orthodontic bonding: A systematic review and meta-analysis. Am J Orthod. Dentofacial Orthop. 2013; 143: S92-103*

1. *May 10, 2017:*

* *Seminars in Orthodontics 1995; Vol. 1 (1): 3-11.*
* *Seminars in Orthodontics 1995; Vol. 1 (1): 12-24.*

1. *May 17, 2017:*

* *Seminars in Orthodontics 1995; Vol. 1 (1):25-30*
* *Seminars in Orthodontics 1995; Vol. 1 (1): 31-36*

1. *May 24, 2017:*

* *Seminars in Orthodontics 1995; Vol. 1 (1):37-43*
* *Seminars in Orthodontics 1995; Vol. 1 (1): 44-54*

***COURSE SCHEDULE:***

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| --- | --- | --- | --- | --- |
| **Week** | **Date** | | | **Content** |
|  | 08 FEB 2017 | | | **Biomaterials**  **COURSE INTRODUCTION: BIOMATERIALS & BIOMECHANICS**  **Lecture & Discussion**: *Adhesives in orthodontics- Enamel etching -Cements in Orthodontics*  **Dr. Nabeel Talic** |
|  | 15 FEB 2017 | | | **Biomaterials**  **Lecture & Discussion**: *Bonding to non-conventional surfaces- Elastomeric ties and chains*  **Dr. Nabeel Talic** |
|  | 22 FEB 2017 | | | **Biomaterials**  **Lecture & Discussion**: *Orthodontic Arch Wires- Friction in Orthodontics*  **Dr. Nabeel Talic** |
|  | 1 MAR 2017 | | | **Biomaterials**  **Lecture & Discussion**: *Temporary Anchorage Devices (TADs)*  **Dr. Nabeel Talic** |
|  | 08 MAR 2017 | | | **Biomaterials**  **Lecture & Discussion**: *Esthetic Appliances – Clear Aligner Therapy*  **Dr. Nabeel Talic** |
|  | 15 MAR 2017 | | | **Biomaterials (Reading Assignment #1)**  **PG 2 Residents Presentations**  **Dr. A. AlHendi** |
|  |  |  |
|  | 22 MAR 2017 | | | **Biomaterials (Reading Assignment # 2)**  **PG 2 Residents Presentations**  **Dr. H. AlHuwaish** |
|  | 29 MAR 2017 | | | **Biomaterials (Reading Assignment # 3)**  **PG 2 Residents Presentations**  **(a,b) Dr. S. AlMeshari, (c) Dr. A. AlHendi, (d) Dr. H. AlHuwaish** |
| ***MID-2ND SEMESTER BREAK (30 MARCH- 09 APRIL 2017)*** | | | | |
|  | 12 APR 2017 | | | **Biomechanics**  **Midterm Examination (25%)**  **Lecture & Discussion**: *Forces & Moments in Orthodontics*  **Dr. Nabeel Talic** |
|  | 19 APR 2017 | | | **Biomechanics**  **Lecture & Discussion**: *One Couple and Two Couple Systems*  ***Hands-on Application on Typodonts***  **Dr. Nabeel Talic** |
|  | 26 APR 2017 | | | ***Biomechanics***  ***Lecture & Discussion****: Mechanics of V-Bends & Stepped Arch Wires, Molar Control*  ***Hands-on Application on Typodonts***  ***Dr. Nabeel Talic*** |
|  | 03 May 2017 | | | **Biomechanics**  **Lecture & Discussion:** *Extra-oral forces: HG, Asymmetrical HG, Face mask*  **Dr. Nabeel Talic** |
|  | 10 May 2017 | | | **Biomechanics**  **(Reading Assignment #4)**  **PG2 Presentations**  **Drs. A. AlHendi, H. AlHuwaish** |
|  | 17 MAY 2017 | | | **Biomechanics**  **(Reading Assignment #5)**  **PG2 Presentations**  **Drs. S. AlMeshari, A. AlHendi** |
|  | 24 MAY 2017 | | | **Biomechanics (Reading Assignment #6)**  **PG2 Presentations**  **Drs. H. AlHuwaish, S. AlMeshari** |
|  |  | | | **FINAL EXAMINATION** |