האוניברסיטה העברית בירושלים
THE HEBREW UNIVERSITY OF JERUSALEM

The Hebrew University of Jerusalem

Syllabus

DENTAL MATERIALS - 97718

Last update 27-12-2023

HU Credits: 4

Degree/Cycle: 1st degree (Bachelor)

Responsible Department: Dental Medicine

Academic year: 0

Semester: 1st Semester

Teaching Languages: Hebrew

Campus: Ein Karem

Course/Module Coordinator: Prof. Feuerstein Osnat

Coordinator Email: osnat.feuerstein@mail.huji.ac.il

Coordinator Office Hours: Wednesday 12:00-14:00

Teaching Staff:

Prof Osnat Feuerstein,
Dr. Shay Levi,
Dr. Eldad Irani

Course/Module description:

The course is composed of group seminars and lectures, mostly recorded lectures accompanied by assignments for submission. The four primary aspects of the course: (1) Terminology and principles of materials science; (2) Structure and properties of the main dental materials, classified to families– polymers, ceramic materials, metals and composite materials; (3) The connection between the theoretical knowledge and its application in the dental clinic; (4) Research methods and scientific literature in dental materials. The student seminars involve demonstrations of materials used in the clinic, and assessment of published research in the domain of dental materials.

Course/Module aims:

The course involves the comprehension of fundamental terms and principles in materials science, with particular emphasis on the relationships between material structures and their properties. The student should recognize the different families of materials and their characteristics, be able to classify dental materials, and to apply this theoretical knowledge in practice to fit the clinical requirement. In addition, the student should develop a competence in critical reading and assessment of research studies in the domain of dental materials.

Learning outcomes - On successful completion of this module, students should be able to:

• Define and describe fundamental terms and principles of material science.
• Relate between materials' structures and their properties.
• Classify dental materials into groups, while discriminating between the characteristics of the materials in the different groups.
• Recognize the correspondence between principles and characteristics of dental materials and their appearance in the dental clinic.
• Asses and compare dental materials, based on the knowledge of their composition and structure.
• Formulate a suitable selection of dental materials for specific cases, based on the theoretical knowledge.
• Analyze and criticize published research articles in the domain of dental materials.

• Conclude rational scientific decisions, explain and justify material choice for a specific dental treatment.

This course supports the following HUHSDM Professional Practice Competencies: 1.2, 3.5

Attendance requirements(%):
100%

Teaching arrangement and method of instruction: Seminars and lectures

Course/Module Content:
Course Program:

27.12 - Course Program and Objectives - Introduction to the world of materials, the connection between structure at different levels and properties - Prof. Feuerstein

Polymers and Composite Materials:

28.12 - Recorded Lecture: Polymers (Parts 1-3) - Prof. Feuerstein

3.1 - Recorded Lecture: Polymers (Parts 4-5) - Prof. Feuerstein

4.1 - Recorded Lecture: Composite Materials (Parts 1-2) - Prof. Feuerstein

10.1 - Recorded Lecture: Composite Materials (Parts 5-3) - Prof. Feuerstein

11.1 - Recorded Lecture: Surface Properties and Adhesion - Prof. Feuerstein

17.1 - Recorded Lecture: Adhesive Materials (Part 1) - Prof. Feuerstein

18.1 - Recorded Lecture: Adhesive Materials (Part 2) - Prof. Feuerstein

24.1 - Group Seminar: Acrylics and Composite Materials -Demonstration, identification and cataloguing (Phantom) - Prof. Feuerstein and instructors

Dental Materials Research:

25.1 - Recorded Lecture: Biocompatibility - Prof. Feuerstein

31.1 - Clinical Characterization and Research Methods for Dental Materials Evaluation - Prof. Feuerstein

1.2 - Virtual Lab Visit for Dental Materials + Reading for the 'Dental Exhibition' - Prof. Feuerstein

7.2 - Group Seminar: Experimental Research in Dental Materials and Published Materials - Helper or/and Misleading? Intermediate task: sorting materials (phantom)- Prof. Feuerstein and instructors

Cements and Impression Materials:

8.2 - Introductory Lecture on Cements and Impression Materials - Dr. Levi

14.2 - Recorded Lecture: Cements (Parts 1-2) - Dr. Levi

15.2 - Recorded Lecture: Impression Materials (Parts 1-2) - Dr. Levi

21.2 - Group Seminar: Cements and Impression Materials (Phantom) - Prof. Feuerstein and instructors

Ceramic Materials:

22.2 - Recorded Lecture: Dental Ceramics: Types, Composition, and Properties (Parts 1-4) - Prof. Feuerstein

28.2 - Recorded Lecture: Ceramic- Metal-Porcelain Adhesion, Use of CAD/CAM Technology (Part 5) - Prof. Feuerstein

29.2 - Evidance-Based Material Selection - Reading for the Seminar - Prof. Feuerstein

6.3 - Group Seminar: Selecting Restorative Materials for Clinical Cases - Evidance-Based (Phantom) - Prof. Feuerstein and instructors

Metals:

7.3 - Recorded Lecture: Amalgam - Dr. Irani

13.3 - Recorded Lecture: Introduction to Metals and Alloys, Considerations in Selecting Alloys - Prof. Philo

14.3 - Submission of Final Tasks in Pairs - Prof. Feuerstein

20.3 - Group Seminar: Working with Amalgam and Presentation of Final Tasks (Phantom) - Prof. Feuerstein and instructors

<u>Required Reading:</u>
1.Restorative Dental Materials / RG Craig
2.Philip's Science of Dental Materials / Anusavice

Additional Reading Material:

None

Grading Scheme:

Essay / Project / Final Assignment / Home Exam / Referat 30 %

Submission assignments during the semester: Exercises / Essays / Audits / Reports / Forum / Simulation / others 40 %

Mid-terms exams 20 %

Attendance / Participation in Field Excursion 10 %

Additional information:

None