CEU
Universidad
San Pablo

Course Description

BIOMATERIALS

2ND YEAR 1ST SEMESTER

DEGREE(S) OF DENTISTRY

MODALITY: ATTENDANCE IS REQUIRED

ACADEMIC YEAR 2022/2023

SCHOOL OF MEDICINE

1. COURSE IDENTIFICATION

1.-COURSE:

Title: Dental biomaterials		
Code: 19697		
Year (s) in which the course is taught: Second	Semester (s) when the course is taught: First	
Type: Compulsory	ECTS of the course: 6	Hours ECTS: 25
Language: English	Modality: Assistance is Required	
School which the course is taught: Higher Polytechnic Schoold (Theory) And Building "D" (Lab. Practices)		

2.- ORGANIZATION OF THE COURSE:

Departament: Dentistry
Subject: Dental Biomaterials

2. LECTURERS OF THE COURSE/SUBJECT

1.-LECTURERS:

Responsible of the course	CONTACT
Name:	Víctor Ortega Asensio
Phone (ext):	902089600 Ext 15098
Email:	victor.ortegaasensio@ceu.es
Office:	D-201

Lecturer (s)	CONTACT
Name:	Carlos Bruno Adell Pérez
Phone (ext):	902089600 Ext 15098
Email:	car.adellperez@ceu.es
Office:	D-201

2.- TUTORIALS:

For any question related with the subject, students could contact teachers by e-mail, phone or visiting their office during the teacher's tutorial times, which shall be made public, on the students' gateway.

3. COURSE DESCRIPTION

This subject of dental biomaterials has the purpose of teaching students the different materials that are used today in the dental clinic.

The objective of the subject is to teach the students how to use these dental biomaterials, their interactions with the oral environment and other biomaterials.

This subject will show the student the wide range of biomaterials that exist and how to choose the correct material according to its characteristics and the needs of each patient.

Also, one of the most recent purposes of this subject is to bring students closer to new technologies and digital systems that nowadays is radically changing the actual dentistry

4. COMPETENCES

1.- COMPETENCES:

Code	Basic and General Skills
CG07	Promote autonomous learning of new knowledge and techniques, as well as motivation for quality.
CG13	Understand and recognize the normal structure and function of the stomatognathic apparatus, at the molecular, cellular, tissue and organic levels, in the different stages of life.

Code	Specific Skills
CE13	Know dental biomaterials: their handling, properties, indications, allergies, bio-compatibility, toxicity, waste disposal and environmental impact.
CE12	Manage, choose and select the appropriate materials and instruments in dentistry.

2.- LEARNING OUTCOMES:

Learning outcomes-

- Provide dentistry students the knowledge of different biomaterials used on dentistry, reproduction of teeth to make unitary prosthesis, partials and completes (dentures)
- General concepts about different biomaterials used in dental restorations
- Composition, properties and clinical uses of biomaterials, and how they interact between them in the biological environment
- Actualization of new techniques and biomaterial to make students more competitive with new technologies in the dental field

Learning the theoretical bases that allow scientifically predict the behaviour of new biomaterials

5. LEARNING ACTIVITIES

1.- DISTRIBUTION OF STUDENTS` ASSIGNMENT:

Total hours of the course	180

Code	Name	In-class teaching
AF1	Theoretical Classes	41
AF2	Laboratory Practices	18
AF4	Evaluation Exam	4
TOTAL Hours		63

Code	Name	Not on-campus hours
AF8	Independent Work	87

2.- LEARNING ACTIVITIES

Learning Activities	DEFINITION
Master Class	The teacher will present the theoretical aspects of the subject, for it teaching supporting material will be used (photocopied documents that will be distributed in class and digitized to be disseminated via the students' gateway. Students have previously read a basic bibliography to be delivered at the beginning of course, with the aim of contrasting points of view.
Laboratory Practice	The practice program is detailed in the lab notebook that will be delivered at the beginning of the year. Classroom practices will be imparted in the laboratory where the teacher will explain the methodology to perform in each practice. Laboratory practices will be made.

6. ASSESMENT OF LEARNING

1.- CLASS ATTENDANCE:

To qualify for the continuous assessment system is necessary attendance to the 75% of the lectures (attendance checks will be done). Since the student can miss 25% of all classes, justifications for absence will not be accepted.
Attendance at practical classes is compulsory 100%.

2.- ASSESMENT METHOD AND CRITERIA:

ORDINARY ASSESMENT (Continual Assessment)		
ASSESSMENT SYSTEM		
Code	Name	Percentage
	Theory exams	55
	Participation in theoretical classes and seminars	15
	Laboratory practices	30

3.- ASSESMENT METHOD DESCRIPTION:

ORDINARY ASSESSMENT (Continual Assessment):

THEORETICAL PART. 55%

- All students will take a final exam compilation (ordinary call). This test will consist of a compilation of 50-question multiple choice test. The mark required to pass is equal to or greater than 5, taking 5 in the test with 35 right questions.

PRACTICE PART: 30% TOTAL MARK

Practice Attendance is compulsory (Daily attendance controls will be realize). The student must attend practice group to which it belongs. Absences from practices shall be justified and the student that have more than three absences justified during the course, or one unexcused absence, must complete an exam of all of the practices. It will be considered as a fault arrive over fifteen minutes late and not bring all the material necessary for the realization of the practice. The responsible teacher should have the justification for at least one month after the absence.

EXTRAORDINARY ASSESSMENT (Final Assessment):

- Those who didn't pass the ordinary exam or didn't assist to the practice need to pass the extraordinary exam to pass the subject. This test will consist of a compilation of 50-question multiple choice test. The mark required to pass is equal to or greater than 5, taking 5 in the test with 35 right questions.

Students who do not attend to the ordinary exam or the extraordinary exam will be qualify with "not presented" whether they have made any academic activity of continuous evaluation"

7. COURSE SYLLABUS

1.- COURSE SYLLABUS

Theoretical program:

1- Dentistry biomaterials historical Background.

2- Physical, chemical, mechanical, thermal and electrical properties of dental biomaterials.

3- Color characteristics, traditional versus digital camera systems.

4- Material's behavior in the biological environment; biocompatibility.

5- Polymers in dentistry. Hydrocolloids. Elastomers. Polyether.

6- Plasters for dental purposes.

7- Digital Impressions.

8- Acrylic resins.

9- Compound resins or composites.

10- Last generation of Aesthetic dental biomaterials.

11- Bonding in dentistry.

12- Dental provisional cements: Calcium hydroxide/ Zinc oxide eugenol.

13- Dental definitive Cements: glass ionomer cements and hybrids/ zinc phosphate.

14- Material for implants: Titanium. Suture.

15- Bone graft and tissue regeneration materials.

16- Malocclusions materials.

17- Root treatment materials in Dentistry.

PRACTICAL WORK PROGRAMME:

Practice nº 1

1-Hydrocolloids: Alginates dosage and management. Impression on toothed model.

Practice nº2

1-Polymers in dentistry. Elastomers: Silicone dosage and management.
2-Bite and occlusion registration wax. Bite registration and occlusion over the toothed models.
3-Cements in dentistry dosage and management.

Practice nº3

1- Plaster dosage and management. Mix, shake and shape. Study model's preparations.

Practice nº 4

1- Baseboard the obtained plaster models.
2- Obtain split bases through the models.
3-Acrylic Resins: Making provisional crowns.

Practice nº 5
1-Updates on new technologies.

MATERIAL THAT STUDENTS MUST BRING TO CARRY OUT THE PRACTICE:

-White dressing grown.
- Rotatory instruments: turbine, Handpiece and contrangle.
-1 tiling or square tiles of 30cm x 30 cm.
-1 Small duralex glass, expulsive width walls with round and smooth base.
-1 Alginate cup.
-1 Plaster cup.
-1Spatula for whipping alginate.
-1Spatula for whipping plaster.
-1 Wax spatula.
- Fine sandpaper.
-4-6 limpression trays
-Middle size rectangular tupper-ware.
-1Safety glasses.
-1 Neutral Vaseline.
-1 roll of 2 cm wide duct tape.
-1 Cement spatula.
-1 steel handpiece's burs.
-1 Spheric width turgsten handipiece's burs.
-1 Dental mirror.
-1 Explorer.
-1 dental tweezers.
-2 gum baseboard.
-1 Alcohol burner

8. BIBLIOGRAPHY

1.- ESSENTIAL BIBLIOGRAPHY:

-Craig's Restorative Dental Materials (Thirteenth Edition). Ronald L. Sakaguchi and John M. Powers (Elsevier)

2.- ADDITIONAL BIBLIOGRAPHY:

-Dental Materials and Their Selection. O'Brien, William J.

-Phillip's science of dental materials. Anusavice, Kenneth J.

-Dental biomaterials: imaging, testing and modelling. Curtis, Richard, Watson, Timothy F.

3.- WEB RESOURCES:

- https://pubmed.ncbi.nlm.nih.gov/

9. ATTITUDE IN THE CLASSROOM

1.- GUIDELINES

The faults in the Academic Integrity (no citation of sources, plagiarism or improper work / prohibited use of information during exams) involve the loss of continuous assessment , subject to punitive actions that are established.

Attendance to the class explanations and respectful attitude, participating with their mates properly.

Diligence and punctuality.

Presence and proper attitude for the development of practices

Any irregular act of academic integrity (no reference to cited sources, plagiarism of work or inappropriate use of prohibited information during examinations) or signing the attendance sheet for fellow students not present in class will result in the student not being eligible for continuous assessment and possibly being penalized according to the University regulations.

10. EXTRAORDINARY MEASURES

Should an exceptional situation occur which prevents continuing with face-to-face teaching under the conditions previously established to this end, the University will take appropriate decisions and adopt the necessary measures to guarantee the acquisition of skills and attainment of learning outcomes as established in this Course Unit Guide. This will be done in accordance with the teaching coordination mechanisms included in the Internal Quality Assurance System of each degree.