

Course title: Mandibular movements registration using electronical devices

Department: Department of Removable Prosthodontics

Address: Gundulićeva 5, Zagreb

Total ECTS points: 2

Course leader: assoc.prof. Samir Čimić

Course associates: /

Teaching plan

	No. classes
Lecture	6
Seminar	3
Practical	/
Total	9

1 class = 45 minutes

Course description

Jaw tracking devices (mechanical) have been used since the 1930s. The introduction of electronical devices for the registration of lower jaw movements in the 1960s led to the development of this part of dentistry. Today, there are various forms of devices for measuring the movements of the lower jaw, and various principles of movements recording - electromechanical, ultrasonic, magnetic, optoelectronical and others. In addition to (quite) different appearance, these devices also differ according to the names given by the manufacturer (axigraph, pantograph, kinesiograph, condylograph, etc.), and according to the reference points (sagittal incisal point, lateral pole of the condyle, terminal hinge axis, kinematic centre). With the large differences between different jaw tracking devices, there is a lot of ambiguity about their use and capabilities.

In the theoretical part of the course, students will be introduced to the principles of recording with jaw tracking devices and to the different recording modules. Possibilities for diagnosing temporomandibular joint disorders with a jaw tracking device will be discussed. Emphasis will be placed on the use of Arcus Digme II during instrumental functional analysis and individualization of articulators. Aim of the seminars is to acquaint students with the possibilities of research using the jaw tracking devices and also their clinical application with regard to the results of research.

Learning outcomes

1. to explain how the jaw tracking device works
2. to identify advantages of complete individualization of the articulator
3. to estimate the capabilities of jaw tracking devices in the diagnosis of temporomandibular disorders
- 4.

Course content

Lecture

	Lecture topics	Number of classes/hours
1.	Jaw tracking devices	1
2.	Different moduls during recording of mandibular movements and positions	1
3.	Registration of condylar position using jaw tracking devices	1
4.	Complete adjustment of articulator	1
5.	Possibilities for diagnostics of temporomandibular dysfunctions using jaw tracking devices	1
6.	Kinematic centre	1
7.	-	-
8.	-	-
9.	-	-
10.	-	-

1 sat = 45 minuta

Seminari

	Seminar topics	Number of classes/hours
1.	Previous research conducted with jaw tracking devices	1
2.	Reference points for recording of condylar position	1
3.	Possibilities for research with jaw tracking devices	1
4.	-	-
5.	-	-
6.	-	-
7.	-	-
8.	-	-
9.	-	-
10.	-	-

1 sat = 45 minuta

Vježbe

	practicals topics	Number of classes/hours
1.	-	-
2.	-	-
3.	-	-

4.	-	-
5.	-	-
6.	-	-
7.	-	-
8.	-	-
9.	-	-
10.	-	-

1 class = 45 minutes

Literature:

1. Naeije M. Measurement of condylar motion: a plea for the use of the condylar kinematic centre. *J Oral Rehabil.* 2003 Mar;30(3):225-30.
2. Pröschel PA, Maul T, Morneburg T. Predicted incidence of excursive occlusal errors in common modes of articulator adjustment. *Int J Prosthodont.* 2000 Jul-Aug;13(4):303-10.
3. Cimić S, Simunković SK, Suncana Simonić Kocijan, Matijević J, Dulčić N, Catić A. ARTICULATOR-RELATED REGISTRATION AND ANALYSIS OF SAGITTAL CONDYLAR INCLINATION. *Acta Clin Croat.* 2015 Dec;54(4):432-7. PMID: 27017716.
4. Pinheiro PF Jr, da Cunha DA, Filho MG, Caldas AS, Melo TM, da Silva HJ. The use of electrognathography in jaw movement research: a literature review. *Cranio.* 2012 Oct;30(4):293-303.
5. Woodford SC, Robinson DL, Mehl A, Lee PVS, Ackland DC. Measurement of normal and pathological mandibular and temporomandibular joint kinematics: A systematic review. *J Biomech.* 2020 Oct 9;111:109994.
6. Piehslinger E, Celar AG, Celar RM, Slavicek R. Computerized axiography: principles and methods. *Cranio.* 1991 Oct;9(4):344-55.

CV (*curriculum vitae*) and bibliography of course leader

Born in 1984 in Banja Luka. Graduated in 2008th (School of Dental Medicine Zagreb). Working at the Department of Removable Prosthodontics since 2009 as a research novice. Doctoral dissertation entitled " Clinical study of movements and positions of lower jaw with ultrasonic method" defended in 2014. Passed the specialist exam in dental prosthodontics in 2016. Became assistant professor at Department of Removable Prosthodontics, School of Dental Medicine Zagreb in 2016, and associate professor in 2021. So far published about thirty scientific and professional papers, and is co-authored on two university textbooks. Actively participated in dozens of domestic and foreign professional and scientific conferences. Participates in the continuing education of dentists. Member of domestic and foreign professional associations and societies (Croatian Dental Chamber, Croatian Prosthodontic Society, Croatian Society for Minimal Interventional Dental Medicine, International association for dental research).

Bibliography of course leader:

<https://www.bib.irb.hr/pretraga?operators=and|%C4%8Cimi%C4%87,%20Samir%20%2825993%29|text|profile>