



# Pomeranian Medical University in Szczecin

## SYLLABUS of the MODULE (SUBJECT)

valid from the academic year 2018/2019

### General Information

<b>Module title</b>	<i>Modern digital technologies in dentistry</i>
Module type	<i>Facultative</i>
Faculty	<i>Faculty of Medicine and Dentistry</i>
Field of study	<i>Medicine and Dentistry</i>
Major	<i>Not applicable</i>
Level of study	<i>long-cycle (S2J)</i>
Mode of study	<i>intramural</i>
Year of studies, semester	<i>Year II, semester 3</i>
ECTS credits (incl. semester breakdown)	<i>1</i>
Type/s of training	<i>lectures (28h)</i>
Form of assessment	<i>graded assessment</i>
Head of the Department/ Clinic, Unit	<i>dr n. tech. inż. Janusz Paweł Kowalski</i>
Tutor responsible for the module	<i>dr n. tech. inż. Janusz Paweł Kowalski</i> <i>inf_dept@pum.edu.pl</i>
Department's/ Clinic's/ Unit's website	<i><a href="https://edu.pum.edu.pl/edu/">https://edu.pum.edu.pl/edu/</a></i>
Language	<i>English</i>

### Detailed information

<b>Module objectives</b>		<i>modern technology in the diagnostics and therapy in dentistry, knowledge of contemporary sources of diagnostic data, methods of data digitization, digital diagnostic imaging, 3D imaging methods, CAD/CAM technology</i>
Prerequisite /essential requirements	Knowledge	<i>basis of modern physics, basis of anatomy, basis of physiology</i>
	Skills	<i>completed a course of Computer Science and Medical Statistic, the use of web browsers, the use of the internet knowledge bases, the use of bibliographic sources</i>
	Competences	<i>habit of learning, working in a team</i>



Description of the learning outcomes for the subject /module			
No. of learning outcome	Student, who has passed the (subject) knows /is able to /can:	SYMBOL (referring the standards) ZEK	Method of verification of learning outcomes
W01	knows imaging techniques of tissues and organs and operating principles of appropriate diagnostic equipment	K_B.W09	open test/ discussion/an essay covering the topic of a class
W02	knows principles of operation of ultrasonic equipment	K_B.W10	open test/ discussion/an essay covering the topic of a class
W03	knows principles of photometry and optical fibers and application of light sources in dentistry	K_B.W11	open test/ discussion/an essay covering the topic of a class
W04	knows principles of operation of lasers in dentistry	K_B.W12	open test/ discussion/an essay covering the topic of a class
W05	knows principles of operation of dental equipment	K_B.W13	open test/ discussion/an essay covering the topic of a class
W06	knows equipment of dental office and instrumentation for dental procedures	K_C.W23	open test/ discussion/an essay covering the topic of a class
W07	knows basic clinical procedures for reconstruction of tooth hard tissue, endodontic treatment and methods and laboratory procedures for prosthetic restorations	K_C.W28	open test/ discussion/an essay covering the topic of a class
W08	knows development of new disciplines in medicine	K_D.W17	open test/ discussion/an essay covering the topic of a class
W09	knows basic methods of medical examination and importance of additional examination with regard to diagnosis, monitoring, prognosis and prophylaxis of organ and systemic disorders in particular its effect on oral cavity tissues	K_E.W02	open test/ discussion/an essay covering the topic of a class
U01	designs prosthetic restorations and knows how to execute them in laboratory	K_C.U13	open test/ discussion/an essay covering the topic of a class
U02	recognizes his/her personal constraints, self-evaluates deficits and education requirements, plans his/her own education activity and evaluation thereof	K_D.U14	open test/ discussion/an essay covering the topic of a class
U03	is able to arrange and run his/her own dental office	K_G.U15	open test/ discussion/an essay covering the topic of a class
K01	shows habit of self-education and lifelong education	K_K01	open test/ discussion/an essay covering the topic of a class



Table presenting learning outcomes of the subject/module in relation to the form of classes									
No.	SYMBOL (referring the standards) ZEK	Type/s of training							
		Lecture	Seminar	Practical classes	Clinical classes	...	...	...	Other...
W01	K_B.W09	x							
W02	K_B.W10	x							
W03	K_B.W11	x							
W04	K_B.W12	x							
W05	K_B.W13	x							
W06	K_C.W23	x							
W07	K_C.W28	x							
W08	K_D.W17	x							
W09	K_E.W02	x							
U01	K_C.U13	x							
U02	K_D.U14	x							
U03	K_G.U15	x							
K01	K_K01	x							

Module contents no.	Description of teaching programme	No. of hours	References to learning outcomes
1	Radiography. Planar radiography. Classic radiography, Computed radiography, Digital Direct Radiography. Properties of digital radiography. Imaging systems. Examples of hardware.	2	W01, W05, W06, W08, W09, U02, U03, K01
2	Digital Direct Radiography. Radiation detectors: types, properties.	2	W01, W05, W06, W08, W09, U02, U03, K01
3	3D digital images. Algorithms of reconstruction	2	W01, W05, W06, W08,, U02, U03, K01
4	CAT Scan technology. Reconstruction of three-dimensional roentgen images. Properties of CBCT. Examples of hardware.	2	W01, W05, W06, W07, W08, W09, U02, U03, K01
5	Intra-Oral Cameras. Camera construction. Technical solutions. Fiberoptic systems. USB cameras. Wireless cameras. Technical characteristics. Examples of hardware.	2	W01, W03, W05, W06, W08, W09, U01, U02, U03, K01
6	3D Optical Scanners. Reverse engineering. Principle of operation of 3D optical scanners. 3D scanners in dentistry. The advantages of using scanners. Examples of hardware.	2	W01, W03, W04, W05, W06, W08, W09, U01, U02, U03, K01
7	Dental lasers. Types of laser. Principle of operation, properties. Applications. Examples of hardware.	2	W01, W04, W05, W06, W07, W08, U02, U03, K01
8	Application of light in dentistry. Examination of the oral mucosa. Principle of operation. Technical solutions.	2	W01, W03, W05, W06, W08, W09, U02, U03, K01
9	CAD/CAM technology. Application in dentistry: purpose, obtained results. Construction of CAD / CAM systems. Application software. Examples of construction.	2	W01, W05, W06, W07, W08, W09, U01, U02, U03, K01
10	Ultrasonic equipment in dentistry.	2	W01, W02, W05, W06, W08, W09, U02, U03, K01



11	Thermography. Examples of application.	2	W01, W05, W06, W08, W09, U02, U03, K01
12	Dental imaging systems. Examples of software.	2	W01, W05, W06, W07, W08, U01, U02, U03, K01
13	Digital image processing. Digital filtering. Morphological processing in practice	1	W01, W05, W06, U02, U03, K01

<b>Booklist</b>	
Obligatory literature:	
1. Materials available on the Internet - links placed on educational pages and of lecture materials	
Supplementary literature:	
1. Introduction to Medical Informatics, Online Lecture Notes, Robert A.Jenders, George Hripcsak, Robert Sideli, Department of Medical Informatics, Columbia University- <a href="http://www.dbmi.columbia.edu/~hripcsak/textbook">http://www.dbmi.columbia.edu/~hripcsak/textbook</a>	
2. MedLine	
3. EBSCO	
4. ProQuest	
5. Gonzales R.C., Woods R.E. Digital image processing, Pearson Prentice Hall, 2008	

Student's workload (balance sheet of ECTS credits)			
Form of student's activity (in-class participation; activeness, produce a report, etc.)	Student's workload [h]		
	Tutor	Student	Average
Contact hours with the tutor	25		
Time spent on preparation to seminars/ practical classess			
Time spent on reading recommended literature	4		
Time spent on writing report/making project			
Time spent on preparing to colloquium/ entry test			
Time spent on preparing to exam			
Other .....			
Student's workload in total	29		
ECTS credits for the subject (in total)	1		
Remarks			
A student is obliged to respect the Department's Internal Didactic Regulations			

\* Selected examples of methods of assessment:

EP – written examination

EU – oral examination

ET – test examination

EPR – practical examination

K – colloquium

R – report

S – practical skills assessment

RZC – practical classes report, incl. discussion on results

O – student's active participation and attitude assessment

SL – lab report

SP – case study

PS - assessment of student's ability to work independently

W – entry test

PM – multimedial presentation

other...