



Template of Course Specification

Faculty: Dentistry

Department: Biophysics

Program: Bachelor of Dental and oral surgery (BDS).

I. General information about the course						
1.	Course Title:	Biophysics				
2.	Course Code and Number :	DBBP1101				
3.	Credit Hours:	Lecture	Seminar/Tutorial	Practical	Training	Total
		2	-	2	-	3
4.	Study Level and Semester:	First Year/ First Semester				
5.	Pre-requisites (if any):					
6.	Co-requisites (if any) :					
7.	Program in which the course is offered	Bachelor of Dental and oral surgery (BDS).				
8.	Teaching Language:	English				
9.	Study System :	Full term				
10.	Prepared by :	Dr. Kafa AL-Muallim				
11.	Approval date :	2023-2024				
12.	Approved by:	Prof. Hasan Al-Shamahy & Dr. Muneer Al-azzani				

II. Course Description

The course leading to Bachelor in Dental Surgery (BDS) takes five academic years. It is divided into two phases. Phase one lasts for three years when the students is trained in basic and paramedical sciences. Phase two consists of two years of clinical studies. Each year is divided into two terms of 15 weeks each.

At the end of each year the student shall sit for an examination before being promoted to the next level.

The first year is a preliminary year where the student shares classes with his colleagues from the other sections of the faculty. General physics is studied in this year.

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III. Course Intended learning outcomes (CILOs) of the course (maximum 8CILOs)		Referenced PILOs (Only write code number referenced Program Intended learning outcomes)	
a.1	Know the scientific terms, fundamental units and basic principles of physics related to medicine and allied subjects.		
a.2	Illustrate information presented in tables graphs and mathematical equations.		
a.3	recognize the principal concepts of physics related Pressure, Vectors, Motion		
b.1	differentiate between the three Newton's laws		
b.2	distinguishes kinds of Rays of light		
b.3	analyzes the electromagnetic spectrum phenomena		
c.1	Measure pressure and temperature.		
c.2	Maintain full and accurate practical records.		
c.3	Display the attitudes necessary for professional practice and conduct.		
c.4	Present the results of practical work in the form of complete understandable and objective reports.		
d.1	Adapt to continuous education, self-development and long-life learning to remain updated with advancement in dental practice.		
d.2	Demonstrate leadership and teamwork skills with colleagues and other oral health		

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	personal in the delivery of oral health care.		
d.3	Use information technologies to enrich and diversity professional experience.		
d.4	Adapt to continuous education, self-development and long-life learning to remain updated with advancement in dental practice.		

IV. Alignment of CILOs to Teaching and Assessment Strategies

First: Alignment of Knowledge and Understanding CILOs

Knowledge and Understanding CILOs	Teaching Strategies	Assessment Strategies
a.1 Know the scientific terms, fundamental units and basic principles of physics related to medicine and allied subjects.	Lectures Discussions Laboratory sections	Written Mid & final theoretical exams Mid & final practical exams Quizzes Practical work assignment Attendance
a.2 Illustrate information presented in tables graphs and mathematical equations.	Lectures Discussions Laboratory sections	Written Mid & final theoretical exams Mid & final practical exams Quizzes Practical work assignment Attendance
a.3 Recognize the principal concepts of physics related Pressure, Vectors, Motion	Lectures Discussions Laboratory sections	Written Mid & final theoretical exams Mid & final practical exams Quizzes Practical work assignment Attendance

Second: Alignment of Intellectual Skills CILOs

Intellectual Skills CILOs	Teaching Strategies	Assessment Strategies
b.1 differentiates between the three Newton's laws	Lectures Discussions Laboratory sections	Written Mid & final theoretical exams Mid & final practical exams Quizzes Practical work assignment Attendance
b.2 distinguishes kinds of Rays of light	Lectures Discussions Laboratory sections	Written Mid & final theoretical exams Mid & final practical exams Quizzes Practical work assignment Attendance

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b.3 analyzes the electromagnetic spectrum phenomena	Lectures Discussions Laboratory sections	Written Mid & final theoretical exams Mid & final practical exams Quizzes Practical work assignment Attendance
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Third: Alignment of Professional and Practical Skills CILOs		
Professional and Practical Skills CILOs	Teaching Strategies	Assessment Strategies
c.1 measure pressure and temperature.	Lectures Discussions Laboratory sections	Written Mid & final theoretical exams Mid & final practical exams Quizzes Practical work assignment Attendance
c.2 Maintain full and accurate practical records.	Lectures Discussions Laboratory sections	Written Mid & final theoretical exams Mid & final practical exams Quizzes Practical work assignment Attendance
c.3 Display the attitudes necessary for professional practice and conduct.	Lectures Discussions Laboratory sections	Written Mid & final theoretical exams Mid & final practical exams Quizzes Practical work assignment Attendance
c.4 Present the results of practical work in the form of complete understandable and objective reports.	Lectures Discussions Laboratory sections	Written Mid & final theoretical exams Mid & final practical exams Quizzes Practical work assignment Attendance

Fourth: Alignment of Transferable (General) Skills CILOs		
Transferable (General) Skills CILOs	Teaching Strategies	Assessment Strategies
d.1 Adapt to continuous education, self-development and long-life learning to remain updated with advancement in dental practice.	Lectures Discussions Laboratory sections	Written Mid & final theoretical exams Mid & final practical exams Quizzes Practical work assignment Attendance

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d.2 Demonstrate leadership and teamwork skills with colleagues and other oral health personal in the delivery of oral health care.	Lectures Discussions Laboratory sections	Written Mid & final theoretical exams Mid & final practical exams Quizzes Practical work assignment Attendance
d.3 Use information technologies to enrich and diversity professional experience.	Lectures Discussions Laboratory sections	Written Mid & final theoretical exams Mid & final practical exams Quizzes Practical work assignment Attendance

V. Course topics and sub-topics (theoretical and practical) with contact hours and alignment to CILOs

Topics/Units of Course Contents

First: Theoretical Aspects

No.	Course Topics/Units	Sub-topics	No. of Weeks	Contact Hours	CILOs
1	Fundamental concepts (introduction)	- What is medical physics - The importance of medical physics - The relationship of physics to medicine	1	2	Explain the relationship of physics to medicine
2	The measurements and physical quantities	- measurement concept - Measurement tools - Measurement units, Types of physical quantities - Examples	1	2	Learn about units of measurement and types of physical quantities
3	Properties of matter	- Fluids - Viscosity	1	2	Explain the properties of materials
4	Pressure and Types of pressure on the body	- Concept - Examples - Blood pressure - pressure inside the skull, pressure in the skeleton, pressure in the digestive system - Eye pressure	1	2	He talks about the damage caused by high pressure in different parts the body

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5	Forces on and in the body	Forces in the body, Forces on the body, Sedimentation	1	2	Compare the forces inside and outside the body
6	Heat and cold in medicine	- Concept - Temperature Measurement Devices - Examples	1	2	Explain the effect of heating and cooling in medicine
7	Physical Methods of Producing Heat in the Body	- Conductive heating - Infrared radiant heating (IR) - Radio wave heating - Micro wave diathermy - Ultrasonic wave heating	1	2	Determines the methods of producing heat in the body
8	Mid-Term Exam		1	2	-----
9	X-rays	- Concept - How do medical x-rays work - Dental X-rays	1	2	Explains the uses of x-rays in dentistry
10	Physics of Radiation Therapy	- Concept - Types of Radiation - Principles of Radiation Therapy, Factors affecting radiodensity - How will radiation affect my teeth?	1	2	Discusses the importance of radiotherapy in medicine
11	Physics of Nuclear Medicine Radioisotopes in Medicine	- Concept - Stable and Radioactive Elements - Examples	1	2	Distinguish the sources of radioactivity in nuclear medicine
12	Radiation Protection	- Types of Radiation - Typical sources of natural radiation - Biological Effect of Ionizing Radiation	1	2	Discusses how to protect from radiation
13	Lasers	- Concept - The use of lasers in dental treatment	1	2	Demonstrates the importance of using lasers in dentistry
14	Applications of lasers	Laser applications in dentistry	1	2	Lists the applications of lasers in

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					dentistry
15	Review	Review all course vocabulary	1	2	-----
16	Final Exam		1	2	-----
Total number of weeks and hours			16	32	

Second: Practical/Tutorial/Clinical Aspects				
Write up practical/tutorial/clinical topics				
No.	Practical/Tutorial/Clinical topics	No. of Weeks	Contact Hours	CILOs
1	Fundamental concepts (introduction)	1	2	Draws the graph correctly
2	Simple pendulum.	1	2	He applies the experiment correctly and finds the gravitational acceleration
3	Using vernier calipers dimensional measurements	1	2	Use the caliper to accurately measure the diameters internal and external and depths
4	Using the micrometer dimensional measurements	1	2	Use the micrometer to accurately measure the diameters of small balls and wire diameters
5	Speed of sound.	1	2	Find the speed of sound in air
6	Blood Pressure	1	2	measure blood pressure correctly
7	Ohm's law.	1	2	Apply Ohm's Law through experiment
8	Viscosity	1	2	Find the viscosity factor
9	Mid practical exams	1	2	-----
10	Final Exam	1	2	-----
Total number of weeks and hours		10	20	

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VI. Tasks and Assignments

No.	Task/Assignment	CILOs	Week due	Mark
1	Practical work assignment & attendance			5
Total				5

VII. Learning Assessment

No.	Assessment Tasks	Week due	Mark	Proportion of Final Assessment	Aligned CILOs
1	Practical work assignment & attendance		5	5%	
2	Quizzes		5	5%	
3	Mid- Term Exam (practical)	7	10	10%	
4	Mid-Term Exam (Theoretical)	8	15	15%	
5	Final Exam (practical)	14	15	15%	
6	Final Exam (Theoretical)	16	50	50%	
Total			100	100%	

VIII. Learning Resources

(Author, (Year), Book Title, Edition, Publisher, Country of publishing)

Textbooks-not more than

1. Elements of physics, seventh edition (SMITH AND COOPER)

Essential References-not less than

1. Measuring physics, H.J.P. KEIGHLEY F.R. McKim A. CLARK M.J. HARRISON

2. Curriculum of general physics of faculty of medicine.

Electronic Materials and Web Sites

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IX. Course Policies (To be determined by Faculty Deanship)

Based on university regulations, the following aspects should be figured out:

1.	(Class Attendance) :Class Attendance: - Attendance of students is taken at beginning of lecture time. - The allowed absence percentage is 20% without excuse and 30% with acceptable excuse, - When student has been absent for more than 30% of course lectures without acceptable excuse, the student will be prohibited from entering subject the final exam.
2.	(Tardy) :If the student came late to class for 15 minutes, he/she is registered absent but he/she allowed to enter the hall to listen lecture presentation.
3.	(Exam Attendance/Punctuality) :According to examination roles or policies: - If the student is absent in the year works exams, the decision is referred to the teacher whether to allow or to reject according to the offered excuse. - If the student is absent in the final exam with an acceptable excuse, the student would be attended the re-sit exam as 1st trial. - If the student is absent in the final exam without an acceptable excuse, the student would be attended re-sit exam as 2nd trial.
4.	(Assignments & Projects) :According to examination roles or policies: - The student should be attended the final exam at certain time and according to the accredited exam table. - If the student came late after 15 minutes from the exam beginning, the student would be to attend the exam with oral monition of never repeat. - In case of the repeat, the student prevented from entrance and considered absent.
5.	(Cheating) :According to examination roles or policies: - If the student cheated in the year works exams of the course, the student prohibited from entrance the final exam and given zero degree with prevented him from entrance the re-sit exam of this course. - If the student cheated in the final exam of the course, the student prohibited from the cheated course and the followed course and given zero degree in both courses, and prevented him from entrance the re-sit exams of them. - If the cheated course is the last at the exam table, the student prohibited from the cheated course and the past course and given zero degree in both courses, and prevented him from entrance the re-sit exams of them. - If the cheating is discovered in subsequent time, the cheated student didn't escape from payment and ordinance is referred to precision committee and the final decision is referred to the collage council. - If the cheating is discovered during the correcting the answered books, the corrector has written a report to the chairman of concerned department for taking available procedure. - The faculty council is able to segregate the student for one academic year in 2nd cheating trial and final segregation from the university after accreditation of university council in 3rd cheating trial.
6.	(Plagiarism) :According to examination roles or policies: Plagiarism means a student plagiarizes the personality of another student. Plagiarism for exam purpose: 1- Both students are prohibited from the plagiarized academic year and all results of them are

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Republic of Yemen

Ministry of Higher Education
and Scientific Research

Sana'a University

Faculty of Dentistry

Quality Assurance Unit



الجمهورية اليمنية

وزارة التعليم العالي والبحث العلمي

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كلية طب الأسنان

وحدة ضمان الجودة

rejected with prohibition of them from entrance the re-sit exam. 2- If the plagiarized student is from outside the university, the student is referred to the university police. - Plagiarism for other purposes: 1- Both students are warned as segregation. 2- If the plagiarized student is from outside the university, the student is referred to the university police.

7. (Other policies) :-The student should be followed the instructions for the exam entrance.
- The student should be followed all systems & laws of the university.

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Dr. Hasan Al-
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Academic
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Center & Quality
Assurance
Ass. Prof. Huda Al-
Emad

Rector of Sana'a
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Course Plan of Biophysics

I. - Information about Faculty Member Responsible for the Course:

Name of Faculty Member	Kafa ALMuallim	Office Hours					
Location & Telephone No.	770927033	SAT	SUN	MON	TUE	WED	THU
E-mail	Kafa.almuallim@gmail.com						

II. Course Identification and General Information:

1-	Course Title:	Biophysics				
2-	Course Number & Code:	DBBP1101				
3-	Credit hours:	C.H				Total
		Theory	Seminar	Practical	F. Tr.	
		2		2		
4-	Study level/year at which this course is offered:	Frist Year-First semester				
5-	Pre –requisite (if any):	None				
6-	Co –requisite (if any):	None				
7-	Program (s) in which the course is offered	BDS Bachelor's degree Dental Surgeon				
8-	Language of teaching the course:	English				
9-	System of Study:	Semesters - full time				
10-	Location of teaching the course:	Faculty of Dentistry, Sana’a University				

III. Course Description:

In fact, Physics is present in everything, from the workings of accurate medical scales, to the imaging equipment like X-rays, MRI, ultrasound and it is useful across many aspects of medicine both in treatment but especially in diagnostic medicine, such as X-Rays, CT, Ultrasound etc. There are many applications of physics in our teeth and jaws—such as forces involved with biting, chewing, and erosion of teeth. In addition, prosthetic (replacement) devices such as bridges and crowns have to be biocompatible as well as have sufficient strength to function properly. You see physics is a great help in the field of medicine without it, we are not able to enjoy what we are enjoying today in terms of treating our diseases.

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IV. Intended learning outcomes (ILOs) of the course

After completing this course, students will be able to:

a.1	Know the scientific terms, fundamental units and basic principles of physics related to medicine and allied subjects.
a.2	Illustrate information presented in tables graphs and mathematical equations.
a.3	Recognize the principal concepts of physics related Pressure, Vectors, Motion
b.1	Differentiate between the three Newton's laws
b.2	Distinguishes kinds of Rays of light
b.3	Analyzes the electromagnetic spectrum phenomena
c.1	Measure pressure and temperature.
c.2	Maintain full and accurate practical records.
c.3	Display the attitudes necessary for professional practice and conduct.
c.4	Present the results of practical work in the form of complete understandable and objective reports.
d.1	Adapt to continuous education, self-development and long-life learning to remain updated with advancement in dental practice
d.2	Demonstrate leadership and teamwork skills with colleagues and other oral health personal in the delivery of oral health care.
d.3	Use information technologies to enrich and diversity professional experience.
d.4	Adapt to continuous education, self-development and long-life learning to remain updated with advancement in dental practice.

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V. Course Content:

First: Theoretical Aspects

Order	Units/Topics List	Sub Topics List	Number of Weeks	contact hours	Learning Outcomes
1	Fundamental concepts (introduction)	- What is medical physics - The importance of medical physics - The relationship of physics to medicine	1 st	2	
2	The measurements and physical quantities	- measurement concept - Measurement tools - Measurement units, Types of physical quantities Examples	2 nd	2	
3	Properties of matter	Fluids Viscosity	3 rd	2	
4	Pressure and Types of pressure on the body	- Concept - Examples - Blood pressure - pressure inside the skull, pressure in the skeleton, pressure in the digestive system Eye pressure	4 th	2	
5	Forces on and in the body	Forces in the body, Forces on the body, Sedimentation	5 th	2	
6	Heat and cold in medicine	- Concept - Temperature Measurement Devices - Examples	6 th	2	
7	Physical Methods of Producing Heat in the Body	- Conductive heating - Infrared radiant heating (IR) - Radio wave heating - Micro wave diathermy - Ultrasonic wave heating	7 th	2	
8	Mid-Term Exam		8 th	2	
9	X-rays	- Concept - How do medical x-rays work	9 th	2	

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		Dental X-rays			
10	Physics of Radiation Therapy	• Concept • Types of Radiation • Principles of Radiation Therapy, Factors affecting radiodensity How will radiation affect my teeth?	10 th	2	
11	Physics of Nuclear Medicine Radioisotopes in Medicine	• Concept • Stable and Radioactive Elements • Examples	11 th	2	
12	Radiation Protection	• Types of Radiation • Typical sources of natural radiation Biological Effect of Ionizing Radiation	12 th	2	
13	Lasers	• Concept The use of lasers in dental treatment	13 th	2	
14	Applications of lasers	Laser applications in dentistry	14 th	2	
15	Review	Review all course vocabulary	15 th	2	
16	Final Exam		16 th	2	
Number of Weeks /and Units Per Semester			16 W	32	

Second: Practical/Tutorial/Clinical Aspects Write up practical/tutorial/clinical topics

Order	Practical/Tutorial/Clinical topics	No. of Weeks	Contact Hours	CILOs
1	Fundamental concepts (introduction)	1 st	2	
2	Simple pendulum.	2 nd	2	
3	Using venire calipers dimensional measurements	3 rd	2	
4	Using the micrometer dimensional measurements	4 th	2	
5	Speed of sound.	5 th	2	
6	Blood Pressure	6 th	2	
7	Ohm's law.	7 th	2	
8	Viscosity	8 th	2	
9	Mid practical exams	9 th	2	

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10	Final Exam	10 th	2	
11		11 th	2	
12		12 th	2	
13		13 th	2	
14		14 th	2	
Number of Weeks /and Units Per Semester		14 W	28 H	

VI. Teaching strategies of the course:

- 1- Lectures,
- 2- Power point slides.
- 3- live demonstrations
- 4- lab training and practice
- 5- self-learning
- 6- Discussion.
- 7- Cooperative Learning.
- 8- Laboratory discussions.

VII. Assignments:

No	Assignments	Aligned CILOs(symbols)	Week Due	Mark
1	Practical work assignment & attendance			5
Total				5

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VIII. Schedule of Assessment Tasks for Students During the Semester:

No	Type of Assessment Tasks	Week Due	Mark	Proportion of Final Assessment
1	Practical work assignment & attendance		5	5%
2	Quizzes		5	5%
3	Mid- Term Exam (practical)	7	10	10%
4	Mid-Term Exam (Theoretical)	8	15	15%
5	Final Exam (practical)	14	15	15%
6	Final Exam (Theoretical)	16	50	50%
	Total	16 W	100	100%

IX. Learning Resources:

- Written in the following order: (Author – Year of publication – Title – Edition – Place of publication – Publisher).

1- Required Textbook(s) (maximum two).

Elements of physics, seventh edition (SMITH AND COOPER)

2- Essential References.

1 Measuring physics, H.J.P. KEIGHLEY F.R. McKim A. CLARK M.J. HARRISON

2 Curriculum of general physics of faculty of medicine.

3- Electronic Materials and Web Sites etc.

X. Course Policies:

1	Class Attendance: - Attendance of students is taken at beginning of lecture time. - After 15 minutes of lecture time the student is considered absent. - When student has been absent for more than 25% of course contents, the student should be prohibited for entrance the final exam.
2	Tardy: - If the student came late to class for 15 minutes, he/she is registered absent but he/she allowed to enter the hall to listen lecture presentation.
3	Exam Attendance/Punctuality:

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	-According to examination roles or policies: - If the student is absent in the year works exams, the decision is referred to the teacher whether to allow or to reject according to the offered excuse. - If the student is absent in the final exam with an acceptable excuse, the student would be attended the re-sit exam as 1st trial. - If the student is absent in the final exam without an acceptable excuse, the student would be attended re-sit exam as 2nd trial.
4	Assignments & Projects: -- According to examination roles or policies: - The student should be attended the final exam at certain time and according to the accredited exam table. - If the student came late after 15 minutes from the exam beginning, the student would be to attend the exam with oral monition of never repeat. - In case of the repeat, the student prevented from entrance and considered absent.
5	Cheating: According to examination roles or policies: - If the student cheated in the year works exams of the course, the student prohibited from entrance the final exam and given zero degree with prevented him from entrance the re-sit exam of this course. - If the student cheated in the final exam of the course, the student prohibited from the cheated course and the followed course and given zero degree in both courses, and prevented him from entrance the re-sit exams of them. - If the cheated course is the last at the exam table, the student prohibited from the cheated course and the past course and given zero degree in both courses, and prevented him from entrance the re-sit exams of them. - If the cheating is discovered in subsequent time, the cheated student didn't escape from payment and ordinance is referred to precision committee and the final decision is referred to the collage council. - If the cheating is discovered during the correcting the answered books, the corrector has written a report to the chairman of concerned department for taking available procedure. - The faculty council is able to segregate the student for one academic year in 2nd cheating trial and final segregation from the university after accreditation of university council in 3rd cheating trial.
6	Plagiarism: -According to examination roles or policies: Plagiarism means a student plagiarizes the personality of another student. Plagiarism for exam purpose: 1- Both students are prohibited from the plagiarized academic year and all results of them are rejected with prohibition of them from entrance the re-sit exam. 2- If the plagiarized student is from outside the university, the student is referred to the university police. -Plagiarism for other purposes:

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Republic of Yemen

Ministry of Higher Education
and Scientific Research

Sana'a University

Faculty of Dentistry

Quality Assurance Unit



الجمهورية اليمنية

وزارة التعليم العالي والبحث العلمي

جامعة صنعاء

كلية طب الأسنان

وحدة ضمان الجودة

	1- Both students are warned as segregation. 2- If the plagiarized student is from outside the university, the student is referred to the university police.
7	Other policies: -The student should be followed the instructions for the exam entrance. - The student should be followed all systems & laws of the university.

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