



Course Specification

— (Bachelor)

Course Title: Medical Biology (2)

Course Code: 370211-4

Program: Program of Bachelor in Radiological Sciences -374000-Level 6

Department: Department of Radiological Sciences

College: College of Applied Medical Sciences

Institution: Taif University

Version: 3

Last Revision Date: 4th September 2023



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A. General information about the course:

1. Course Identification

1. Credit Hours: 4 Hours (3 T + 1 P)

2. Course Type

A. University College Department Track Others
B. Required Elective

3. Level/Year at which this course is offered: (2nd Level/ First Year)

4. Course General Description: Medical Biology-1/ 370111-4

5. Pre-requirements for this course (if any): None

-None

6. Co-requirements for this course (if any): None

-None

7. Course Main Objective(s):

This course provides an overview of the structure and function of different human body systems. The main goal of this course is to help the students to understand the anatomy and physiology of body systems such as respiratory, urinary, skeletal etc, and relate how the activities of the systems are integrated to form a functional whole.

2. Teaching mode (mark all that apply)

No	Mode of Instruction	Contact Hours	Percentage
1	Traditional classroom	5 hours /week= 50 hours/semester	62.5%
2	E-learning	None	00%
3	Blended learning	None	00%
4	Other (Laboratory)	3 hours /week= 30 hours/semester	3.7%



3. Contact Hours (based on the academic semester)

No	Activity	Contact Hours
1.	Lectures	50
2.	Laboratory/Studio	30
3.	Field	N/A
4.	Tutorial	N/A
5.	Others (specify)	N/A
Total		80 Hours

B. Course Learning Outcomes (CLOs), Teaching Strategies and Assessment Methods

Code	Course Learning Outcomes	Code of PLOs Aligned with Course Learning Outcomes	Teaching Strategies	Assessment Methods
1.0	Knowledge and Understanding			
1.1	Recognize the structure and function of different human body systems	K1	Lectures	Written Exams
1.2	Define the basic anatomy and physiology of body systems, and relate how the activities of the systems are integrated to form a functional whole.	K1	Lectures	Written Exams
1.3	Identify the basic types of blood cells and relate with their normal values.	K1	Lectures	Written Exams
2.0	Skills			
2.1	Analyze the blood components and blood groups on micrograph pictures	S1	Practical Sessions	Practical Exam
3.0	Values, Autonomy, and Responsibility			



Code	Course Learning Outcomes	Code of PLOs Aligned with Course Learning Outcomes	Teaching Strategies	Assessment Methods
3.1		NONE		

C.1 Course Content (Theory)

S. NO	List of Topics Physiology Part	Contact Hours	List of Topics Anatomy Part	Contact Hours
1.	Introduction & Blood (Presentation)	3	Introduction & Bone, joints	2
2.	Cardio Vascular System (CVS) (Presentation)	3	CVS	2
3.	Respiratory system (Presentation)	3	Respiratory	2
4.	Gastro Intestinal Tract (GIT) (Presentation)	3	GIT	2
5.	Urinary system (Presentation)	3	Urinary	2
6.	Nervous system (Presentation)	3	Nervous system 1	2
7.	Male Reproduction system (Presentation)	3	Male genital system	2
8.	Female Reproduction system (Presentation)	3	Female genital system	2
9.	Lymphatic system	3	Lymphatic system	2
10.	Endocrinology system (Presentation)	3	Endocrinology system	2
Total Contact Hours		50		



C.2 Course Content (Practical)

S. NO	List of Topics	Contact Hours
1.	Introduction to Organization of the Human Body and major organ system of the human body (Lab Manual + Presentation)	3
2.	Introduction to Blood components (Lab Manual + Presentation)	3
3.	Identification and calculation of Red blood cells (Lab Manual + Presentation)	3
4.	Identification and calculation of white blood cells (WBCs) (Lab Manual + Presentation)	3
5.	Blood grouping (Lab Manual + Presentation)	3
6.	Circulatory system (Lab Manual + Presentation)	3
7.	Skeletal system (Lab Manual + Presentation)	3
8.	Urinary system (Lab Manual + Presentation)	3
9.	Digestive system (Lab Manual + Presentation)	3
10.	Nervous system (Lab Manual + Presentation)	3
Total Contact Hours		30

D. Students Assessment Activities

No	Assessment Activities *	Assessment timing (in week no)	Percentage of Total Assessment Score
1.	Mid-Term Exam	5th week	30%
2.	Activity	Throughout	10%
3.	Practical quiz and discussion	Throughout	20%
4.	Final Exam	18 th week	40%
Total			100%

*Assessment Activities (i.e., Written test, oral test, oral presentation, group project, essay, etc.).





E. Learning Resources and Facilities

1. References and Learning Resources

Essential References	<ul style="list-style-type: none"> Principles of Anatomy and Physiology (2016), Gerard J. Tortora and Bryan. H. Derrickson, 15th Edition, Wiley Publishers, ISBN: 978-1-119-32064-7. Cell Biology and Histology (2014), Leslie P. Gartner and James L. Hiatt, 7th edition, Wolters Kluwer Publications, ISBN: 9781451189513.
Supportive References	None
Electronic Materials	Websites, Search engines (Saudi Digital Library, PubMed, Google Scholar)
Other Learning Materials	Saudi digital library

2. Required Facilities and equipment

Items	Resources
Facilities (Classrooms, laboratories, exhibition rooms, simulation rooms, etc.)	Classrooms and Laboratories
Technology Equipment (projector, smart board, software)	Data Show, Blackboard and A/V Aids
Other Equipment (depending on the nature of the specialty)	None

F. Assessment of Course Quality

Assessment Areas/Issues	Assessor	Assessment Methods
Student's feedback on effectiveness of teaching.	<ul style="list-style-type: none"> Students 	<ul style="list-style-type: none"> Indirect: Questionnaire survey at the end of each semester.
Quality of learning resources (laboratory and library) related to each course.	<ul style="list-style-type: none"> Students Staff members 	<ul style="list-style-type: none"> Indirect: Questionnaire survey at the end of each semester related to learning resources.
Evaluation of teaching	<ul style="list-style-type: none"> Peer evaluators 	<ul style="list-style-type: none"> Indirect: Peer evaluation





Assessment Areas/Issues	Assessor	Assessment Methods
Evaluation of exam quality and assessment.	<ul style="list-style-type: none"> Exam committee Students 	<ul style="list-style-type: none"> Direct: Exam paper/ exam blueprint review Indirect: Questionnaire survey at the end of each semester.
Achievement of course learning outcomes	<ul style="list-style-type: none"> Course Coordinators Development and accreditation committee 	<ul style="list-style-type: none"> Direct: Student's performance assessed through item analysis and rubrics.

Evaluation areas (e.g., Effectiveness of teaching and assessment, Extent of achievement of course learning outcomes, Quality of learning resources, etc.) **Evaluators** (Students, Faculty, Program Leaders, Peer Reviewer, Others (specify) **Assessment Methods** (Direct, Indirect)

G. Specification Approval

COUNCIL /COMMITTEE	DEPARTMENT COUNCIL
REFERENCE NO.	11 TH
DATE	24 TH MAY 2022





Course Specification

— (Bachelor)

Course Title: **Medical Chemistry (2)**

Course Code: **370212-4**

Program: **Program of Bachelor in Radiological Sciences -374000-Level 6**

Department: **Department of Radiological Sciences**

College: **College of Applied Medical Sciences**

Institution: **Taif University**

Version: **3**

Last Revision Date: **4th September 2023**



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A. General information about the course:

1. Course Identification

1. Credit Hours:

4 Hours (3 T + 1 P)

2. Course Type

A. University College Department Track Others

B. Required Elective

3. Level/Year at which this course is offered: (2nd Level/ First Year)

4. Course General Description:

The main purpose of the course is to provide learners with the fundamental biochemical background about the compounds of life which includes carbohydrates, proteins and amino acids, lipids, enzymes, nucleic acids, vitamins, and minerals. They will also learn about the structure and classifications of these compounds and their biological functions and roles at the cellular level.

5. Pre-requirements for this course (if any):

Medical Chemistry (1)/ 370112-3

6. Co-requirements for this course (if any):

None

7. Course Main Objective(s):

The main objective of this course is to make students understand the basics of major biomolecules such as carbohydrates, lipids, and proteins. These include structure, classification, chemical reactions, different types of chemical bonds, nomenclature, and biological functions.

2. Teaching mode (mark all that apply)

No	Mode of Instruction	Contact Hours	Percentage
1	Traditional classroom	45 hours/15 weeks	60%
2	E-learning	None	0%
3	Hybrid <ul style="list-style-type: none"> • Traditional classroom • E-learning 	None	0%
4	Distance learning	None	0%
5	Other (Laboratory)	30 hours/15 weeks	40%



3. Contact Hours (based on the academic semester)

No	Activity	Contact Hours
1.	Lectures	45
2.	Laboratory/Studio	30
3.	Field	NA
4.	Tutorial	NA
5.	Others (specify)	NA
Total		75

B. Course Learning Outcomes (CLOs), Teaching Strategies and Assessment Methods

Code	Course Learning Outcomes	Code of PLOs Aligned with Course Learning Outcomes	Teaching Strategies	Assessment Methods
1.0	Knowledge and Understanding			
1.1	Identify the chemical structure, classification, properties and function of carbohydrates, lipids, proteins and nucleic acids as well as their primary structural units.	K1	Lectures	Written Exam
1.2	Describe the isomerism and biological functions of some individual sugars, fatty acids and amino acids.	K1	Lectures	Written Exam
1.3	Recall the various vitamins and minerals, and their sources, absorption, transport, and function.	K1	Lectures	Written Exam
1.4	State principles of basic biochemical laboratory tests such as those for proteins, carbohydrates and lipids.	K2	*Lectures *Practical Sessions	*Written Exam *Practical Exam
2.0	Skills			
2.1	Analyze basic biochemical reactions and correlate	S2	*Lectures	*Practical Exam





Code	Course Learning Outcomes	Code of PLOs Aligned with Course Learning Outcomes	Teaching Strategies	Assessment Methods
	these with the laboratory findings.		*Practical Sessions	*Objective Structured Practical Examination (OSPE)
3.0	Values, Autonomy, and Responsibility			
	None			

C.1 Course Content (Theory)

No	List of Topics	Contact Hours
1.	Module 1: Carbohydrates (Presentation) <ul style="list-style-type: none"> • Introduction to carbohydrates • Classification of monosaccharides • Common monosaccharides • Monosaccharides reactions and derivatives Oligosaccharides and polysaccharides	10
2.	Module 2: Lipids (Presentation) <ul style="list-style-type: none"> • Introduction to lipids • Classification of lipids • Fatty acids structure and properties • Reactions of fatty acids • Glyceride and non-glyceride lipids Bio-membranes	10
3.	Module 3: Proteins and amino acids (Presentation and Book Chapter No. 1, Pages 1-5) <ul style="list-style-type: none"> • Introduction to proteins and amino acids • Biological importance of proteins • Amino acids classification, properties, and reactions Important peptides <ul style="list-style-type: none"> • Proteins structure and classifications 	8
4.	Module 4: Enzymes (Presentation) <ul style="list-style-type: none"> • Introduction to enzymology • Enzymes mechanism of action • Factors affecting enzyme activity • Enzyme activity regulations 	8





	<ul style="list-style-type: none"> Enzyme inhibition Importance of enzymes in clinical diagnoses	
5.	Module 5: Nucleic acids (Presentation) <ul style="list-style-type: none"> Nucleotides structure and function DNA structure and properties RNA structure and properties	6
6.	Module 6: Vitamins & Minerals (Presentation) <ul style="list-style-type: none"> Classification Functions and metabolism Vitamins/minerals deficiency and associated disorders	3
Total		45

C.2 Course Content (Practical)

No	List of Topics	Contact Hours
1.	Lab Safety (Presentation + Lab Manual)	2
2.	Glassware used in biochemistry lab (Presentation + Lab Manual)	2
3.	Qualitative reactions of carbohydrates (Presentation + Lab Manual)	6
4.	Qualitative reactions of lipids (Presentation + Lab Manual)	4
5.	Qualitative reactions of proteins (Presentation + Lab Manual)	4
6.	Enzyme activity (Presentation + Lab Manual)	4
7.	Principles of electrophoresis (Presentation + Lab Manual)	4
8.	Revision (Presentation + Lab Manual)	4
Total		30

D. Students Assessment Activities

No	Assessment Activities *	Assessment timing (in week no)	Percentage of Total Assessment Score
1.	Mid-Term Exam	7 th week	20
2.	Activity (Quiz 1)	Before Midterm	5
3.	Activity (Quiz 2)	After Midterm	5
4.	Practical Assessment (Quizzes and Discussions)	Throughout	20
5.	Final Theoretical Exam	17 th week	50
TOTAL			100%

*Assessment Activities (i.e., Written test, oral test, oral presentation, group project, essay, etc.).





E. Learning Resources and Facilities

1. References and Learning Resources

Essential References	Denise R. Ferrier. Lippincott's Illustrated Reviews: Biochemistry (2014) 6 th Edition, Wolter Kluwer Health Publishers (Philadelphia), ISBN Number: 978-1-4511-7562-2.
Supportive References	CLS Program's Lab Manual of Medical Chemistry (2)
Electronic Materials	SDL: https://sdl.edu.sa/SDLPortal/en/Publishers.aspx PubMed: https://www.ncbi.nlm.nih.gov/pubmed/
Other Learning Materials	None

2. Required Facilities and equipment

Items	Resources
Facilities (Classrooms, laboratories, exhibition rooms, simulation rooms, etc.)	Classrooms and Laboratories
Technology Equipment (projector, smart board, software)	Data Show, Blackboard and A/V
Other Equipment (depending on the nature of the specialty)	<ul style="list-style-type: none"> Laboratory should be stocked with all necessary consumable materials (chemicals, reagents, kits, gloves, etc). All safety materials, tools, and regulations must be available and applied appropriately. <p>Necessary laboratory equipment should be available such as fridge, spectrophotometry, pipettes, pH meter, glassware etc.</p>

F. Assessment of Course Quality

Assessment Areas/Issues	Assessor	Assessment Methods
Student's feedback on effectiveness of teaching.	<ul style="list-style-type: none"> Students 	<ul style="list-style-type: none"> Indirect: Questionnaire survey at the end of each semester.
Quality of learning resources (laboratory and library) related to each course.	<ul style="list-style-type: none"> Students Staff members 	<ul style="list-style-type: none"> Indirect: Questionnaire survey at the end of each semester related to learning resources.
Evaluation of teaching	<ul style="list-style-type: none"> Peer evaluators 	<ul style="list-style-type: none"> Indirect: Peer evaluation



Assessment Areas/Issues	Assessor	Assessment Methods
Evaluation of exam quality and assessment.	<ul style="list-style-type: none"> Exam committee Students 	<ul style="list-style-type: none"> Direct: Exam paper/ exam blueprint review Indirect: Questionnaire survey at the end of each semester.
Achievement of course learning outcomes	<ul style="list-style-type: none"> Course Coordinators Development and accreditation committee 	<ul style="list-style-type: none"> Direct: Student's performance assessed through item analysis and rubrics.

Assessors (Students, Faculty, Program Leaders, Peer Reviewer, Others (specify))

Assessment Methods (Direct, Indirect)

G. Specification Approval

COUNCIL /COMMITTEE	DEPARTMENT COUNCIL
REFERENCE NO.	11 TH
DATE	24 TH MAY 2022





Course Specification

— (Bachelor)

Course Title: **Medical Physics**

Course Code: **370213-3**

Program: **Program of Bachelor in Radiological Sciences -374000-Level 6**

Department: **Department of Radiological Sciences**

College: **College of Applied Medical Sciences**

Institution: **Taif University**

Version: **3**

Last Revision Date: **4th September 2023**



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A. General information about the course:

1. Course Identification

1. Credit hours: (3 hours)					
2. Course type					
A.	<input type="checkbox"/> University	<input checked="" type="checkbox"/> College	<input type="checkbox"/> Department	<input type="checkbox"/> Track	<input type="checkbox"/> Others
B.	<input checked="" type="checkbox"/> Required		<input type="checkbox"/> Elective		
3. Level/year at which this course is offered: (2nd level/1st Year)					
4. Course general Description:					
Medical Physics course is essential for all medical sciences programs as it is concerned with the basic knowledge of human body physics and mechanisms. Course deals with the applications of physics phenomena on the healthy performance of the human body.					
5. Pre-requirements for this course (if any):					
None					
6. Co-requirements for this course (if any):					
None					
7. Course Main Objective(s):					
The main objective of this course is to provide the students with the principles of physics and its applications as well as effects on human body organs' functions, and its clinical implication in medical specialties.					

2. Teaching mode (mark all that apply)

No	Mode of Instruction	Contact Hours	Percentage
1	Traditional classroom	64	100%
2	E-learning		
3	Hybrid <ul style="list-style-type: none"> • Traditional classroom • E-learning 	-	-
4	Distance learning	-	-

3. Contact Hours (based on the academic semester)

No	Activity	Contact Hours
1.	Lectures	40
2.	Laboratory/Studio	-
3.	Field	-
4.	Tutorial	24
5.	Others (specify)	-
Total		64





B. Course Learning Outcomes (CLOs), Teaching Strategies and Assessment Methods

Code	Course Learning Outcomes	Code of PLOs aligned with course	Teaching Strategies	Assessment Methods
1.0	Knowledge and understanding			
1.1	Identify basic concepts of different human body performances in the framework of physics.	K1	Lecture	Theoretical Exams -Survey
1.2	Describe the application of medical physics in the healthy performance of the human body	K1	Lectures and Practical sessions	Theoretical Exams and Standardized oral examination (S OE -Survey
2.0	Skills			
2.1	Recognize technologies and tools used in healthcare in the framework of physics.	S3	Lectures and Practical sessions	Theoretical Exams and Standardized oral examination (S OE -Survey
3.0	Values, autonomy, and responsibility			
3.1	-	-	-	-

C. Course Content

No	List of Topics	Contact Hours
1.	Introduction and basic definitions of radioactivity. (Ch. 11, p. 731-741)	1
2.	Ionizing and non-ionizing radiation types, spectrum, and nuclear transformation. (Ch. 11, p. 731-741)	2
3.	Radioactive decay, half-life, and isotopes. (Ch. 11, p. 731-741)	3
4.	Radiation protection, Clinical applications of different types of radiation (Ch. 11, p. 731-741)	3
5.	An introduction of force in and on the human body. (Ch. 2, p. 492-494)	2
6.	Levers, types, laws, and conservation of energy. (Ch. 2, p. 494-497)	3
7.	Friction Forces, Centrifuge Force, and its medical applications. (Ch. 2, p. 497-500)	3
8.	How the blood and lungs interact. (Ch. 8, p. 533-538)	2
9.	Physics and mechanism of the breathing. (Ch. 8, p. 538-543)	3
10.	Inhalation and Exhalation processes. (Ch. 8, p. 543-551)	2
11.	Airways resistance and Compliance and time constant. (Ch. 8, p. 551-564)	3
12.	Lung Time constant, Physics of some common lung diseases. (Ch. 8, p. 533-564)	3





13.	Electricity within the body and ions distribution. (Ch. 12, p. 833-835)	3
14.	Structure of nerve cell, action and polarization potential speed and propagation. (Ch. 12, p. 836-839)	3
15.	Heart structure and heart cycle from physics point of view. (Ch. 12, p. 840-848)	2
16.	Nerve conduction, Latency, EMG and ECG. (Ch. 12, p. 849-855)	2
No	List of Pracical Topics	Contact Hours
1	Definition and presentation of data, information, and knowledge	2
2	Types of data presentation and how to express data as figures	2
3	Measurements of Lung functions	2
4	Application on Spirometer and interpretation of the Spiro gram	2
5	Hook's law	2
6	Calculation of the relation between stress and strain	2
7	Gravity, friction, and Buoyant forces	2
8	Calculation of the liquid viscosity	2
9	Inverse square law	2
10	Calculation of the relation between intensity and radiation exposure	2
11	Half value layer of the radiation source	2
12	Summary and Applications Application on ECG	2
Total		64

D. Students Assessment Activities

No	Assessment Activities *	Assessment timing (in week no)	Percentage of Total Assessment Score
1.	Midterm Theory Exam [Standardized Tests: MCQs]	7 th	30 %
2.	Quiz (Online Test)	5 th	20%
3.	Final Practical Exam [SOE]	16 th	10 %
4.	Final Theory Exam [Standardized Tests: MCQs]	17-18 th	40 %

*Assessment Activities (i.e., Written test, oral test, oral presentation, group project, essay, etc.).

E. Learning Resources and Facilities

1. References and Learning Resources

Essential References	Physics of the Human Body, 2 nd Edition, Irving P. Herman, Springer, 2016. ISBN : 978-3-319-23930-9. DOI : 10.1007/978-3-319-23932-3
Supportive References	Physics of the Human Body, 2 nd Edition, Irving P. Herman, Springer, 2016. ISBN : 978-3-319-23930-9. DOI : 10.1007/978-3-319-23932-3
Electronic Materials	None
Other Learning Materials	None



2. Required Facilities and equipment

Items	Resources
facilities (Classrooms, laboratories, exhibition rooms, simulation rooms, etc.)	Blackboard Access, Classrooms Science Laboratories
Technology equipment (projector, smart board, software)	Data show and software to access Blackboard
Other equipment (depending on the nature of the specialty)	None

F. Assessment of Course Quality

Assessment Areas/Issues	Assessor	Assessment Methods
Effectiveness of teaching	Program Leaders	Direct
Effectiveness of Students assessment	Students, peer review	Direct, Indirect
Quality of learning resources	Student, Faculty	Indirect
The extent to which CLOs have been achieved	Faculty	Direct
Other	-	-

Assessors (Students, Faculty, Program Leaders, Peer Reviewer, Others (specify))

Assessment Methods (Direct, Indirect)

G. Specification Approval

COUNCIL /COMMITTEE	DEPARTMENT COUNCIL
REFERENCE NO.	11TH
DATE	24TH MAY 2022

