



Course Specifications

Course Title:	General and Systemic pathology
Course Code:	373238-2
Program:	Bachelor in Clinical Laboratory Sciences; Level-6 (Program Code: 373000)
Department:	Clinical Laboratory Sciences Department
College:	College of Applied Medical Sciences
Institution:	Taif University

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A. Course Identification

1. Credit hours: 2 Hours Theory
2. Course type a. University <input type="checkbox"/> College Department <input checked="" type="checkbox"/> Others b. Required <input checked="" type="checkbox"/> Elective <input type="checkbox"/>
3. Level/year at which this course is offered: 6 th Level/ Second Year
4. Pre-requisites for this course (if any): Principles of Anatomy and Histology (373219-3)
5. Co-requisites for this course (if any): None

6. Mode of Instruction (mark all that apply)

No	Mode of Instruction	Contact Hours	Percentage
1	Traditional classroom	3 hours /week= 30 hours/semester	100%
2	Blended	None	0%
3	E-learning	None	0%
4	Distance learning	None	0%
5	Other (Laboratory)	None	0%

7. Contact Hours (based on academic semester)

No	Activity	Contact Hours
1	Lecture	30
2	Laboratory/Studio	N/A
3	Tutorial	N/A
4	Others (specify)	NA
	Total	30 Hours

B. Course Objectives and Learning Outcomes

1. Course Description This course will cover the basic pathological aspects of diseases (etiology, predisposing factors, and pathogenesis. morphologic changes as well as fate and prognosis). The course also aims to cover the main general diseases such as inflammation, neoplasia, cell injuries and; process & types of tissue repair as well as the common system diseases.
2. Course Main Objective The main purpose of this course is to let students gain proper knowledge about general classification of diseases of different systems, understand the pathological basis of diseases in the form of etiology, pathogenesis, gross & microscopic changes, complications and prognosis.

3. Course Learning Outcomes

CLOs		Aligned PLOs
1	Knowledge and Understanding	
1.1	Define the different pathological terms, list classification of different diseases and know factors affecting the prognosis of each diseases.	K1
1.2	Understand the mechanism of diseases, and their structural and functional disturbances.	K1
1.3	Describe the basic morphologic changes of the diseases in the form of gross and microscopic pictures.	K1
2	Skills:	
2.1	Interpret the different pathological gross and microscopic changes associated with different pathological conditions and correlate with functional disturbances and clinical manifestations	S2
2.2	Employ efficiently the different knowledge resources including the library resources and the web sites in problem solving and completing tasks.	S4
3	Values:	
3.1	Display responsible behaviour through creating community awareness about cause and risk factors of diseases and prevention of their occurrence.	V2

C. Course Content (Theory)

No	List of Topics	Contact Hours
1	Introduction of pathology: (Presentation) <ul style="list-style-type: none"> - Pathology - Pathogenesis - Etiology - Clinical significance of diseases: Signs & Symptoms - Morphologic changes - Fate of diseases (Complication & Prognosis) 	3
2	Inflammation: (Book Chapter No. 2/ Pages 18-35) <ul style="list-style-type: none"> - Acute inflammation - Chronic inflammation (granulomas) 	3
3	Healing and Repair: (Presentation) <ul style="list-style-type: none"> - Types of healing - Mechanism of healing by fibrosis and Granulation tissue - Types of wound Healing - Complication of wound healing 	3

4	Circulatory Disturbance: (Presentation) <ul style="list-style-type: none"> - Hyperemia, Congestion and ischemia - Thrombosis & Embolism - Hemorrhage & Edema 	3
5	Cell injury (reversible and irreversible): (Book Chapter No. 1/ Pages 1-17) <ul style="list-style-type: none"> - Adaptation - Degeneration - Necrosis and Apoptosis 	3
6	Neoplasia (Disturbances of Growth): (Book Chapter No. 5/ Pages 71-91) <ul style="list-style-type: none"> - Benign tumors - Malignant tumors 	3
7	Diseases of the breast: (Presentation) <ul style="list-style-type: none"> - Inflammatory diseases - Neoplastic conditions 	3
8	Diseases of female reproductive system: (Presentation) <ul style="list-style-type: none"> - Inflammatory diseases - Hormonal disturbances effects - Neoplastic conditions 	3
9	Diseases of urinary tract: (Book Chapter No. 16/ Pages 350-377) <ul style="list-style-type: none"> - Inflammatory diseases - Urinary stones & Urinary obstruction - Neoplastic conditions 	3
10	Diseases of respiratory tract (Presentation) <ul style="list-style-type: none"> - Inflammatory diseases - Chronic Obstructive Pulmonary Diseases - Neoplastic conditions 	3
Total		30

D. Teaching and Assessment

1. Alignment of Course Learning Outcomes with Teaching Strategies and Assessment Methods

Code	Course Learning Outcomes	Teaching Strategies	Assessment Methods
1.0	Knowledge and Understanding		
1.1	Define the different pathological terms, list classification of different diseases and know factors affecting the prognosis of each diseases.	<ul style="list-style-type: none"> Lecture 	<ul style="list-style-type: none"> Written Exam
1.2	Understand the mechanism of diseases, and their structural and functional disturbances.	<ul style="list-style-type: none"> Lecture 	<ul style="list-style-type: none"> Written Exam
1.3	Describe the basic morphologic changes of the diseases in the form of gross and microscopic pictures.	<ul style="list-style-type: none"> Lecture 	<ul style="list-style-type: none"> Written Exam
2.0	Skills		
2.1	Interpret the different pathological gross and microscopic changes associated with different pathological conditions and correlate with functional disturbances and clinical manifestations	<ul style="list-style-type: none"> Lectures 	<ul style="list-style-type: none"> Written Exam OSPE
2.2	Employ efficiently the different knowledge resources including the library resources and the web sites in problem solving and completing tasks.	<ul style="list-style-type: none"> Problem-Based Learning Group discussion 	<ul style="list-style-type: none"> Written Exam Scientific Activity
3.0	Values		
3.1	Display responsible behaviour through creating community awareness about cause and risk factors of diseases and prevention of their occurrence.	<ul style="list-style-type: none"> Service Learning 	<ul style="list-style-type: none"> Activity

2. Assessment Tasks for Students

#	Assessment task*	Week Due	Percentage of Total Assessment Score
1	Mid-Term Exam	5 th week	30%
2	Activity	8 th week	10%
3	Final Exam	12 th /13 th week	60%
Total			100%

*Assessment task (i.e., written test, oral test, oral presentation, group project, essay, etc.)

E. Student Academic Counseling and Support

Arrangements for availability of faculty and teaching staff for individual student consultations and academic advice:

- Course instructors are available for individual consultation in their free time. They are usually full-time permanent members present on-campus from 8:00 am to 2:30 pm on all working days. Appointments can be made in person with the instructor through email etc. Days and time availability of each instructor are posted on their doors. Course instructors provide a range of academic and course management advice including course planning and its progression.
- Each student at the department of Clinical Laboratory Sciences has an academic adviser who is available for individual consultation and guidance. Appointments can be made in person with the instructor through email etc. Days and time availability of each adviser are posted on their doors. The academic adviser can provide support with time management, exam preparation, clarification of subject requirements, feedback on performance and dealing with personal issues as well.

F. Learning Resources and Facilities

1. Learning Resources

Required Textbooks	<ul style="list-style-type: none"> • Emanuel Rubin; Howard M. Reisner (2009). Essentials of Rubin's Pathology (2009) 5th Edition. Lippincott's-Williams Publishers. ISBN: 978-07817-7324-9. • Paul Bass; Susan Burroughs; Norman Carr and Claire Way (2009). Master Medicine: General and Systematic Pathology, 3rd Edition, Elsevier Limited Publishers. ISBN: 9780080451299; ISBN: eText ISBN: 9780702048142, 0702048143.
Essential References Materials	<ul style="list-style-type: none"> • Vinay Kumar , Abul K. Abbas and Jon C. Aster (2020). Robbins and Cotran Pathologic Basis of Disease, 10th Edition. Elsevier-Health Sciences Division Publishers. ISBN-10: 032353113X; ISBN-13: 9780323531139. • Simon Cross. Underwood's Pathology (2018); 7th Edition, Elsevier Health Sciences. ISBN-10: 0702072125; ISBN-13: 9780702072123.
Electronic Materials	Websites, Search engines (Saudi Digital Library, PubMed, Google Scholar)
Other Learning Materials	Journals, Scientific Magazines and Articles. <ul style="list-style-type: none"> ▪ Pathology Journal – Elsevier ▪ The American Journal of Pathology ▪ Pathology Journal Online Journal in Pathology – MDLinx ▪ Diagnostic Pathology Journal

2. Facilities Required

Item	Resources
Accommodation (Classrooms, laboratories, demonstration rooms/labs, etc.)	Classrooms
Technology Resources (AV, data show, Smart Board, software, etc.)	Data show, Blackboard and A/V
Other Resources (Specify, e.g. if specific laboratory equipment is required, list requirements or attach a list)	None

G. Course Quality Evaluation

Evaluation Areas/Issues	Evaluators	Evaluation 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
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)

H. Specification Approval Data

Council / Committee	Department Council
Reference No.	Meeting Number 11
Date	19/05/2022





Course Specifications

Course Title:	Human Physiology
Course Code:	373220-2
Program:	Bachelor in Clinical Laboratory Sciences; Level-6 (Program Code: 373000)
Department:	Clinical Laboratory Sciences Department
College:	College of Applied Medical Sciences
Institution:	Taif University

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1. Learning Resources	7
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A. Course Identification

1. Credit hours: 2 Hours Theory
2. Course type
a. University <input type="checkbox"/> College <input type="checkbox"/> Department <input checked="" type="checkbox"/> Others <input type="checkbox"/>
b. Required <input checked="" type="checkbox"/> Elective <input type="checkbox"/>
3. Level/year at which this course is offered: 6 th Level/ Second Year
4. Pre-requisites for this course (if any): Medical Biology (2)/ 370211-4
5. Co-requisites for this course (if any): None

6. Mode of Instruction (mark all that apply)

No	Mode of Instruction	Contact Hours	Percentage
1	Traditional classroom	3 hours /week= 30 hours/semester	100%
2	Blended	None	0%
3	E-learning	None	0%
4	Distance learning	None	0%
5	Other (Laboratory)	None	0%

7. Contact Hours (based on academic semester)

No	Activity	Contact Hours
1	Lecture	30
2	Laboratory/Studio	N/A
3	Tutorial	N/A
4	Others (specify)	NA
	Total	30 Hours

B. Course Objectives and Learning Outcomes

<p>1. Course Description</p> <p>Human physiology deals with basic theoretical knowledge about functions of body systems. The focus of the course will be on the cardiovascular, respiratory, endocrine, reproductive, urinary, gastrointestinal tract (GIT) and central nervous system and concepts of homeostasis and control mechanisms - with emphasis on clinical relevance.</p>
<p>1. Course Objective</p> <p>After studying the course, the student will be able to: Recognize the normal physiological functions and controls of various human body systems, describe the normal basal values to help in diagnosis of various pathological conditions and show initiative, the ability to work both independently and as part of a team.</p>

3. Course Learning Outcomes

CLOs		Aligned PLOs
1	Knowledge and Understanding	
1.1	Recognize various functions of cardiovascular and respiratory system.	K1
1.2	Describe various functions of endocrine and reproductive and system.	K1
1.3	List various functions of urinary, digestive, and nervous system.	K1
2	Skills:	
2.1	Interpret the normal basal values to help in diagnosis of various pathological conditions	S2
2.2	Employ effective communication and management skills for optimum utilization of time and resources.	S4
3	Values:	
None		

C. Course Content (Theory)

No	List of Topics	Contact Hours
1	Cardiovascular System: Blood Chapter 27, Pages 499-527 (Textbook-2) - Blood compositions and functions.	3
2	Cardiovascular System: Heart Chapter 5, Pages 87-92 (Textbook-1) - Functional characteristics of the heart. - Physiological properties of cardiac muscle. - Pacemaker activity (automatism) of the heart. - Cardiac cycle and heart sounds.	3
3	Cardiovascular System: Heart Chapter 5, Pages 94-100 (Textbook-1) - Cardiac output and heart rate. - Factors affecting venous return. - Regulation of blood volume. - Regulation of blood pressure.	3
4	Respiratory System Chapter 10, Pages 234-260 (Textbook-1) - Pulmonary ventilation and mechanics of breathing. - Alveolar gas exchange. - Tissue gas exchange. - Transport of blood gases - oxyhemoglobin dissociation curve - Control and regulation of respiration.	3

5	Endocrine Glands Chapter 9, Pages 217-229 (Textbook-1) <ul style="list-style-type: none"> - Pituitary gland hormones (functions, control, disorders). - Thyroid hormones (functions, control, disorders). - Parathyroid hormones (functions, control, disorders). 	3
6	Reproduction Chapter 18, Pages 450-463 (Textbook-1) <ul style="list-style-type: none"> - Male reproductive system. - Female reproductive system. 	3
7	Urinary System Chapter 13, Pages 338-348 (Textbook-1) <ul style="list-style-type: none"> - Kidney Functions. - Mechanism of urine formation. - Renal acid-base and electrolytes regulation. - Micturition Reflex. 	3
8	Digestive System Chapter 12, Pages 287-317 (Textbook-1) <ul style="list-style-type: none"> - Motor functions (Motility) of GIT. - Secretory functions (Secretions) of GIT. - How is the digestive process controlled? 	3
9	Nervous System Chapter 7, Pages 144-162 (Textbook-1) <ul style="list-style-type: none"> - Neural tissue functions - Central nervous system – functions 	3
10	Autonomic Nervous System Chapter 60, Pages 748-759 (Textbook-3) <ul style="list-style-type: none"> - Functions of sympathetic, and parasympathetic nerves 	3
Total		30

D. Teaching and Assessment

1. Alignment of Course Learning Outcomes with Teaching Strategies and Assessment Methods

Code	Course Learning Outcomes	Teaching Strategies	Assessment Methods
1.0	Knowledge and Understanding		
1.1	Recognize various functions of cardiovascular and respiratory system.	• Lecture	• Written Exam • Assignment
1.2	Describe various functions of endocrine and reproductive and system.	• Lecture	• Written Exam • Assignment
1.3	List various functions of urinary, digestive, and nervous system.	• Lecture	• Written Exam • Assignment

Code	Course Learning Outcomes	Teaching Strategies	Assessment Methods
2.0	Skills		
2.1	Interpret the normal basal values to help in diagnosis of various pathological conditions	<ul style="list-style-type: none"> Lecture Problem-Based Learning 	<ul style="list-style-type: none"> Written Exam
2.2	Employ effective communication and management skills for optimum utilization of time and resources.	<ul style="list-style-type: none"> Group Discussion 	<ul style="list-style-type: none"> Scientific Activity
3.0	Values		
None			

2. Assessment Tasks for Students

#	Assessment task*	Week Due	Percentage of Total Assessment Score
1	Mid-Term Exam	5 th week	30%
2	Activity	Throughout	10%
3	Final Exam	12 th /13 th week	60%
	Total		100%

*Assessment task (i.e., written test, oral test, oral presentation, group project, essay, etc.)

E. Student Academic Counseling and Support

Arrangements for availability of faculty and teaching staff for individual student consultations and academic advice:

- Course instructors are available for individual consultation in their free time. They are usually full-time permanent members present on-campus from 8:00 am to 2:30 pm on all working days. Appointments can be made in person with the instructor through email etc. Days and time availability of each instructor are posted on their doors. Course instructors provide a range of academic and course management advice including course planning and its progression.
- Each student at the department of Clinical Laboratory Sciences has an academic adviser who is available for individual consultation and guidance. Appointments can be made in person with the instructor through email etc. Days and time availability of each adviser are posted on their doors. The academic adviser can provide support with time management, exam preparation, clarification of subject requirements, feedback on performance and dealing with personal issues as well.

F. Learning Resources and Facilities

1. Learning Resources

Required Textbooks	<ul style="list-style-type: none"> Anne Waugh and Allison Grant (2014), Ross & Wilson Anatomy and Physiology in Health and Illness, 12th Edition. Elsevier Publishers. Paperback ISBN: 9780702053269; eBook ISBN: 9780702072840 William Ganong, Review of Medical Physiology (2005), 22nd Edition, Lange Publishers. ISBN-13: 978-0071265607; ISBN-10: 0071440402 John E. Hall & Michael E. Hall, Guyton and Hall Textbook of Medical Physiology (2020), 14th Edition, Elsevier Publishers, ISBN-13: 9780323597128
Essential References Materials	<ul style="list-style-type: none"> None
Electronic Materials	<ul style="list-style-type: none"> Websites, Search engines (Saudi Digital Library, PubMed, Google Scholar)
Other Learning Materials	<ul style="list-style-type: none"> None

2. Facilities Required

Item	Resources
Accommodation (Classrooms, laboratories, demonstration rooms/labs, etc.)	Classrooms
Technology Resources (AV, data show, Smart Board, software, etc.)	Data show, Blackboard and A/V
Other Resources (Specify, e.g. if specific laboratory equipment is required, list requirements or attach a list)	None

G. Course Quality Evaluation

Evaluation Areas/Issues	Evaluators	Evaluation 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

Evaluation Areas/Issues	Evaluators	Evaluation 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)

H. Specification Approval Data

Council / Committee	Department Council
Reference No.	Meeting Number 11
Date	19/05/2022





Course Specifications

Course Title:	Medical Biochemistry
Course Code:	373226-3
Program:	Bachelor in Clinical Laboratory Sciences; Level-6 (Program Code: 373000)
Department:	Clinical Laboratory Sciences Department
College:	College of Applied Medical Sciences
Institution:	Taif University

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1. Learning Resources	6
2. Facilities Required.....	7
G. Course Quality Evaluation	7
H. Specification Approval Data	7

A. Course Identification

1. Credit hours: 3 Hours (2 T + 1 P)
2. Course type
a. University <input type="checkbox"/> College <input type="checkbox"/> Department <input checked="" type="checkbox"/> Others <input type="checkbox"/>
b. Required <input checked="" type="checkbox"/> Elective <input type="checkbox"/>
3. Level/year at which this course is offered: 6 th Level/ Second Year
4. Pre-requisites for this course (if any): Medical Chemistry (2)/ 370212-4
5. Co-requisites for this course (if any): None

6. Mode of Instruction (mark all that apply)

No	Mode of Instruction	Contact Hours	Percentage
1	Traditional classroom	3 hours /week= 30 hours/semester	50%
2	Blended	None	0%
3	E-learning	None	0%
4	Distance learning	None	0%
5	Other (Laboratory)	3 hours /week= 30 hours/semester	50%

7. Contact Hours (based on academic semester)

No	Activity	Contact Hours
1	Lecture	30
2	Laboratory/Studio	30
3	Tutorial	N/A
4	Others (specify)	NA
	Total	60 Hours

B. Course Objectives and Learning Outcomes

<p>1. Course Description</p> <p>This course is mainly concerned with understanding metabolic pathways of carbohydrates such as glucose, fructose, galactose and glycogen; lipids such as fatty acids, triglycerides, lipoproteins, cholesterol and steroids; proteins and amino acids, nitrogen metabolism and urea cycle.</p>
<p>2. Course Main Objective</p> <p>The main purpose of this course is to make students understand the metabolic pathways of carbohydrates, lipids, and proteins; know the functions, steps and regulatory mechanisms of these pathways.</p>

3. Course Learning Outcomes

CLOs		Aligned PLOs
1	Knowledge and Understanding	
1.1	Describe major metabolic and regulatory events that control the body functions and their clinical relevance on biochemical basis.	K1
1.2	Recognize techniques and procedures used for specimen collection, handling and testing.	K2
2	Skills:	
2.1	Operate various laboratory wares and instruments used in chemistry laboratory, safely and proficiently.	S1
2.2	Analyse metabolic disorders and correlate these with laboratory findings.	S2
3	Values:	
3.1	Display professional and responsible attitude while performing tasks related to the course.	V1

C. Course Content (Theory)

No	List of Topics	Contact Hours
1	Introduction to metabolism (Presentation)	2
2	Carbohydrate Metabolism: Carbohydrate digestion and absorption (Presentation)	3
3	Glycolysis, TCA Cycle, Electron Transport Chain (Presentation)	3
4	Pentose Phosphate Pathway, Fructose and Galactose Metabolism (Book Chapter No. 13/ Pages 145-156)	3
5	Glycogen Metabolism (Presentation)	3
6	Lipid Metabolism: Lipid Digestion, Absorption, and lipoprotein metabolism (Book Chapter No. 15/ Pages 173-180)	3
7	Triglyceride metabolism and fatty acids oxidation (Presentation)	3
8	Ketone bodies and cholesterol metabolism (Presentation)	3
9	Protein Metabolism: Protein digestion and absorption (Presentation)	3
10	Nitrogen balance and urea cycle (Presentation)	3
11	Purine and pyrimidine metabolism (Presentation)	1
Total		30

C. Course Content (Practical)

No	List of Topics	Contact Hours
1	Safety in biochemistry lab and disposal of laboratory waste. (Lab Manual and Demonstration)	3
2	<ul style="list-style-type: none"> Specimen collection: whole blood, plasma, serum, urine, CSF and other body fluids. (Lab Manual and Demonstration) Specimen preservation and anticoagulants. (Lab Manual and Demonstration) 	6
3	Commonly used equipments and instruments in biochemistry laboratory. (Lab Manual and Demonstration)	3
4	<ul style="list-style-type: none"> Spectrophotometric estimation of plasma glucose levels (Lab Manual and Demonstration) Fasting levels Postprandial levels 	3
5	Performing urinalysis using strip test (Lab Manual and Demonstration)	3
6	Lipid profile tests (Lab Manual and Demonstration) Estimation of serum total cholesterol	3
7	Estimation of serum HDL-cholesterol (Lab Manual and Demonstration)	3
8	Estimation of serum LDL – cholesterol (Lab Manual and Demonstration)	3
9	Estimation of serum triglycerides (Lab Manual and Demonstration)	3
Total		30

D. Teaching and Assessment

1. Alignment of Course Learning Outcomes with Teaching Strategies and Assessment Methods

Code	Course Learning Outcomes	Teaching Strategies	Assessment Methods
1.0	Knowledge and Understanding		
1.1	Describe major metabolic and regulatory events that control the body functions and their clinical relevance on biochemical basis.	<ul style="list-style-type: none"> Lectures 	<ul style="list-style-type: none"> Written Exam
1.2	Recognize techniques and procedures used for specimen collection, handling and testing.	<ul style="list-style-type: none"> Lectures Practical sessions 	<ul style="list-style-type: none"> Written Exam Practical Exam Lab Report
2.0	Skills		
2.1	Operate various laboratory wares and instruments used in chemistry laboratory, safely and proficiently.	<ul style="list-style-type: none"> Practical session 	<ul style="list-style-type: none"> Practical exam Lab Report
2.2	Analyse metabolic disorders and correlate these with laboratory findings.	<ul style="list-style-type: none"> Lectures Practical Session Problem-Based Learning 	<ul style="list-style-type: none"> Written Exam OSPE
3.0	Values		
3.1	Display professional and responsible attitude while performing tasks related to the course.	<ul style="list-style-type: none"> Group Discussion 	<ul style="list-style-type: none"> Activity

2. Assessment Tasks for Students

#	Assessment task*	Week Due	Percentage of Total Assessment Score
1	Mid-Term Exam	5 th week	15%
2	Activity	Throughout	5%
3	Practical report	Throughout	10%
4	Final Practical Exam	11 th week	20%
5	Final Exam	12 th /13 th week	50%
	Total		100%

*Assessment task (i.e., written test, oral test, oral presentation, group project, essay, etc.)

E. Student Academic Counseling and Support

Arrangements for availability of faculty and teaching staff for individual student consultations and academic advice:

- Course instructors are available for individual consultation in their free time. They are usually full-time permanent members present on-campus from 8:00 am to 2:30 pm on all working days. Appointments can be made in person with the instructor through email etc. Days and time availability of each instructor are posted on their doors. Course instructors provide a range of academic and course management advice including course planning and its progression.
- Each student at the department of Clinical Laboratory Sciences has an academic adviser who is available for individual consultation and guidance. Appointments can be made in person with the instructor through email etc. Days and time availability of each adviser are posted on their doors. The academic adviser can provide support with time management, exam preparation, clarification of subject requirements, feedback on performance and dealing with personal issues as well.

F. Learning Resources and Facilities

1. Learning Resources

Required Textbooks	<ul style="list-style-type: none"> • Denise R. Ferrier. Lippincott's Illustrated Reviews: Biochemistry (2014), 6th Edition, Wolter Kluwer Health Publishers (Philadelphia), ISBN Number: 978-1-4511-7562-2. • Thomas M. Devlin, Textbook of Biochemistry with Clinical Correlations (2010), 7th Edition. John Wiley and Sons Publishers. ISBN-13: 978-0-470-28173-4
Essential ReferencesMaterials	<ul style="list-style-type: none"> •
Electronic Materials	<ul style="list-style-type: none"> • None
Other LearningMaterials	<ul style="list-style-type: none"> • Saudi Digital Library

2. Facilities Required

Item	Resources
Accommodation (Classrooms, laboratories, demonstration rooms/labs, etc.)	Classrooms and Laboratories
Technology Resources (AV, data show, Smart Board, software, etc.)	Data show, Blackboard and A/V
Other Resources (Specify, e.g. if specific laboratory equipment is required, list requirements or attach a list)	Spectrophotometry, Biochemical kits ELISA Electrophoresis

G. Course Quality Evaluation

Evaluation Areas/Issues	Evaluators	Evaluation 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
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)

H. Specification Approval Data

Council / Committee	Department Council
Reference No.	Meeting Number 11
Date	19/05/2022



Course Specifications

Course Title:	Medical Laboratory Instrumentation
Course Code:	373229-2
Program:	Bachelor in Clinical Laboratory Sciences; Level-6 (Program Code: 373000)
Department:	Clinical Laboratory Sciences Department
College:	College of Applied Medical Sciences
Institution:	Taif University

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A. Course Identification

1. Credit hours: 2 Hours Theory
2. Course type
a. University <input type="checkbox"/> College <input type="checkbox"/> Department <input checked="" type="checkbox"/> Others <input type="checkbox"/>
b. Required <input checked="" type="checkbox"/> Elective <input type="checkbox"/>
3. Level/year at which this course is offered: 6 th Level/ Second Year
4. Pre-requisites for this course (if any): None
5. Co-requisites for this course (if any): None

6. Mode of Instruction (mark all that apply)

No	Mode of Instruction	Contact Hours	Percentage
1	Traditional classroom	3 hours /week= 30 hours/semester	100%
2	Blended	None	0%
3	E-learning	None	0%
4	Distance learning	None	0%
5	Other (Laboratory)	None	0%

7. Contact Hours (based on academic semester)

No	Activity	Contact Hours
1	Lecture	30
2	Laboratory/Studio	N/A
3	Tutorial	N/A
4	Others (specify)	NA
	Total	30 Hours

B. Course Objectives and Learning Outcomes

1. Course Description
This course is designed to introduce students to the basic laboratory instrumentation with the analytical methods common to both clinical and research laboratories. The course will help them explore miscellaneous instruments and techniques through their applications and uses.
1. Course Objective
To provide knowledge of basic laboratory instrumentations, their safety and principles.

3. Course Learning Outcomes

CLOs		Aligned PLOs
1	Knowledge and Understanding	
1.1	Describe the function and principles of the major clinical laboratory instruments and their components	K2
1.2	Recognize the possible hazards and safety precautions for the different clinical laboratory instruments.	K2
1.3	Identify principles of laboratory analysis and quality assurance/performance explicitly.	K2
2	Skills:	
2.1	Justify the necessity for careful observation and accurate measurement and calibration.	S3
2.2	Practice data analysis as applied to clinical laboratory field.	S5
3	Values:	
None		

C. Course Content

No	List of Topics	Contact Hours
1	Safety and quality control (Presentation) <ul style="list-style-type: none"> Lab and equipment safety Quality control and Quality assurance 	3
2	Bioimaging (Presentation) <ul style="list-style-type: none"> Light microscope Electron microscope Fluorescent microscope 	6
3	Chemical Analysis (Presentation) <ul style="list-style-type: none"> Spectrophotometer Atomic Absorption Spectroscopy Atomic Emission Spectroscopy Chromatography HPLC Automated Chemical analyzer 	12
4	Hematological analyzers (Presentation) <ul style="list-style-type: none"> CBC Flow cytometry 	3
5	Molecular Testing (Presentation) <ul style="list-style-type: none"> PCR Electrophoresis and gel documentation system 	3
6	Immunology (Presentation) <ul style="list-style-type: none"> ELISA 	3
Total		30

D. Teaching and Assessment

1. Alignment of Course Learning Outcomes with Teaching Strategies and Assessment Methods

Code	Course Learning Outcomes	Teaching Strategies	Assessment Methods
1.0	Knowledge and Understanding		
1.1	Describe the function and principles of the major clinical laboratory instruments and their components	<ul style="list-style-type: none"> Lectures 	<ul style="list-style-type: none"> Written Exam
1.2	Recognize the possible hazards and safety precautions for the different clinical laboratory instruments.	<ul style="list-style-type: none"> Lectures 	<ul style="list-style-type: none"> Written Exam
1.3	Identify principles of laboratory analysis and quality assurance/performance explicitly.	<ul style="list-style-type: none"> Lectures 	<ul style="list-style-type: none"> Written Exam
2.0	Skills		
2.1	Justify the necessity for careful observation and accurate measurement and calibration.	<ul style="list-style-type: none"> Lectures 	<ul style="list-style-type: none"> Written Exam
2.2	Practice data analysis as applied to clinical laboratory field.	<ul style="list-style-type: none"> Lectures 	<ul style="list-style-type: none"> Written Exam Scientific Activities
3.0	Values		
None			

2. Assessment Tasks for Students

#	Assessment task*	Week Due	Percentage of Total Assessment Score
1	Mid-Term Exam	5 th week	30%
2	Activity	Throughout	10%
3	Final Exam	12 th /13 th week	60%
Total			100%

*Assessment task (i.e., written test, oral test, oral presentation, group project, essay, etc.)

E. Student Academic Counseling and Support

Arrangements for availability of faculty and teaching staff for individual student consultations and academic advice:

- Course instructors are available for individual consultation in their free time. They are usually full-time permanent members present on-campus from 8:00 am to 2:30 pm on all working days. Appointments can be made in person with the instructor through email etc. Days and time availability of each instructor are posted on their doors. Course instructors provide a range of academic and course management advice including course planning and its progression.
- Each student at the department of Clinical Laboratory Sciences has an academic adviser who is available for individual consultation and guidance. Appointments can be made in person with the instructor through email etc. Days and time availability of each adviser are posted on their doors. The academic adviser can provide support with time management, exam preparation, clarification of subject requirements, feedback on performance and dealing with personal issues as well.

F. Learning Resources and Facilities

1. Learning Resources

Required Textbooks	<ul style="list-style-type: none">• Turgeon ML. Linne & Ringsrud's Clinical Laboratory Science: The Basics and Routine Techniques. (2020). 8th Edition. Mosby: Maryland, USA. ISBN: 9780323530828• Webster JG. Bioinstrumentation. (2003). 1st Edition. Wiley: Hoboken, New Jersey, USA. ISBN: 9780471263272• Ramnik Sood. Medical Laboratory Technology: Methods and Interpretations. (2009). 6th Edition. Jaypee Brothers Medical Pub. ISBN: 9788184484496
Essential References Materials	<ul style="list-style-type: none">• None
Electronic Materials	<ul style="list-style-type: none">• Virtual labs at www.labster.com.• Principles of each instrument at www.youtube.com.
Other Learning Materials	<ul style="list-style-type: none">• None

2. Facilities Required

Item	Resources
Accommodation (Classrooms, laboratories, demonstration rooms/labs, etc.)	Classrooms
Technology Resources (AV, data show, Smart Board, software, etc.)	Data show, Blackboard and A/V
Other Resources (Specify, e.g. if specific laboratory equipment is required, list requirements or attach a list)	None

G. Course Quality Evaluation

Evaluation Areas/Issues	Evaluators	Evaluation 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.
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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.

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