Course Specifications

Course Title:	**Microscopic preparations**
Course Code:	**312BIO-2**
Program:	**Biology**
Department:	**Biology**
College:	**College of Arts and Sciences**
Institution:	**Najran University**

Table of Contents

A. Course Identification

1. Credit hours:2
2. Course type **a.** University ☐ College ☐ Department ☒ Others ☐ **b.** Required ☒ Elective ☐
3. Level/year at which this course is offered: V/ 3rd year
4. Pre-requisites for this course (if any)**: non**
5. Co-requisites for this course (if any)**: non**

6. Mode of Instruction (mark all that apply)

No	Mode of Instruction	Contact Hours	Percentage
1	**Traditional classroom**	15	
2	**Blended**		
3	**E-learning**		
4	**Correspondence**		
5	**Other**	-	

7. Actual Learning Hours (based on academic semester)

No	Activity	Learning Hours
Contact Hours		
1	**Lecture**	15
2	**Laboratory/Studio**	30
3	**Tutorial**	
4	**Others** (specify) E-learning	
	Total	45
Other Learning Hours*		
1	**Study**	17
2	**Assignments**	3
3	**Library**	5
4	**Projects/Research Essays/Theses**	5
5	**Others** (specify)**: Office hours**	10
	Total	40

***** The length of time that a learner takes to complete learning activities that lead to achievement of course learning outcomes, such as study time, homework assignments, projects, preparing presentations, library times

B. Course Objectives and Learning Outcomes

1. Course Description

The course will expand the student's knowledge of some applied microscopic techniques to prepare and study histological sections in animals and plants using different stains. This could be achieved through a group of practical laboratories.

2. Course Main Objective

1- Recognize different types of laboratory equipments used in microscopic preparations
2- Identify the different types of biological preparations and stains
3- Recognize cutting samples using microtomes and the cutting defects and concludes treated
4- Explain the installation of a microscope and the idea of his work and compares two types of
5- Apply the laboratory rules in microscopic preparations
6- Practiced methods of sample preparation.

3. Course Learning Outcomes

CLOs		Aligned PLOs
1	**Knowledge:**	
1.1	Recognize different types of laboratory equipments used in microscopic preparations	
1.2	Identify the different types of biological preparations and stains	
1.3	Recognize cutting samples using microtomes and the cutting defects and concludes treated	
2	**Skills :**	
2.1	Explain the installation of a microscope and the idea of his work and compares two types of	
2.2	Apply the laboratory rules in microscopic preparations	
2.3	Practiced methods of sample preparation.	
3	**Competence:**	
3.1	Work independently and as a team work	
3.2	Manage recourses, time and other members of the group	
3.3	Communicate knowledge with others	

C. Course Content: Theoritical

No	List of Topics	Contact Hours
1	A general introduction to laboratory preparations Laboratory rules and public methods in microscopic preparations Definitions of micro-techniques	1
2	Laboratory devices and tools used in the lab preparations Installation of the microscope and the types of lenses	1
3	Methods of sample preparation	1
4	Different patterns of biological preparations	1
5	General steps to prepare histological sections (permanent preparation of	1
6	Types microtroms and methods of use and types of knives used	1
7	A general introduction to laboratory preparations	1
8	Detailed study of different methods of dehydration and fixation.	1
9	Detailed study of sectioning (slicing) and mounting	1
10	Detailed study of the block preparation	1

11	Staining of animal histological preparation using Haematoxylin and Eosin. Dye sectors, Paste media sectors	1
12	Staining with Tri Malory stain.	1
13	Types microtroms and methods of use and types of knives used	1
14	Cutting samples using microtomes and the cutting defects and treatment	1
15	Microscopic drawing and painting	1
Total		15

Practical:

No	List of Topics	Contact Hours
1	A general introduction to laboratory preparations Laboratory rules and public methods in microscopic preparations Definitions of micro-techniques	2
2	Laboratory devices and tools used in the lab preparations Installation of the microscope and the types of lenses	2
3	Methods of sample preparation	2
4	Different patterns of biological preparations	2
5	General steps to prepare histological sections	2
6	Types microtroms and methods of use and types of knives used	2
7	A general introduction to laboratory preparations	2
8	Detailed study of different methods of dehydration and fixation.	2
9	Detailed study of sectioning (slicing) and mounting	2
10	Detailed study of the block preparation	2
11	Staining of animal histological preparation using Haematoxylin and Eosin. Dye sectors, Paste media sectors	2
12	Staining with Tri Malory stain.	2
13	Types microtroms and methods of use and types of knives used	2
14	Cutting samples using microtomes and the cutting defects and treatment	2
15	Microscopic drawing and painting	2
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:**		
1.1	Recognize different types of laboratory equipments used in microscopic preparations	**Lectures**	Final and semester exams
1.2	Identify the different types of biological preparations and stains	**Lectures**	Final and semester exams
1.3	Recognize cutting samples using microtomes and the cutting defects and concludes treated	**Lectures**	Final and semester exams
2.0	**Skills :**		

Code	Course Learning Outcomes	Teaching Strategies	Assessment Methods
2.1	Explain the installation of a microscope and the idea of his work and compares two types of	Student negotiations	Class room activity
2.2	Apply the laboratory rules in microscopic preparations	Student negotiations	Class room activity
2.3	Practiced methods of sample preparation.	Student negotiations	Class room activity
3.0	**Competence:**		
3.1	Work independently and as a team work	Student negotiations	Class room activity
3.2	Manage recourses, time and other members of the group	Student negotiations	Class room activity
3.3	Communicate knowledge with others	Student negotiations	Class room activity

2. Assessment Tasks for Students

#	Assessment task*	Week Due	Percentage of Total Assessment Score
1	Theoretical First Exam	7	10%
2	Practical First Exam	7	5%
3	Theoretical Second Exam	12	10%
4	Practical Second Exam	12	5%
5	Practical final Exam	12	10%
6	Assays , oral presentations, blackboard activity	continuous	10%
٧	Theoretical Final Exam	16	50%

***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 :

- 10 hours per week as office hours
- Academic advisor 10 hours per week

F. Learning Resources and Facilities

1.Learning Resources

Required Textbooks	1. Microscopic technique: the preparation of microscopic preparations.D. Mahmoud Ahmed Banhawy, d Moner on Ganzory. Knowledge House, Egypt, the first edition 1989. 2. Kiernan, j. A. (1981): Histological and histochemical methods, theory and practice. Pergamon Press, New York. 3. Spector D. L, Goldman R. D. Basic Methods in Microscopy: Protocols and Concepts from Cells: A Laboratory Manual 2nd Edition. Amazon Press. 2005.
Essential References Materials	Cain D. Hanks H., Weis M., Bottoms C. and Lawson J. 2013. Microbiology Laboratory Manual. Tutorial website for Microbiology laboratory. http://www.swtc.edu:8082/mscenter/mthsci/science/1tools/p02amtrc.pps K. Barker. At the Bench: A Laboratory Navigator, Updated edition. Cold Spring Harbor Laboratory Press, New York, Pp. 465 2005.

	Roberts A. Plant Structure and Development Lab Manual. Department of Biological Sciences University of Rhode Island, 2015. http://www.uri.edu/cels/bio/plant_anatomy/bio311.pdf
Electronic Materials	http://www.austincc.edu/ddingley/MLAB1331/LabManual/LabManual.htm http://histologylab.ccnmtl.columbia.edu/histological_techniques/ http://ccnmtl.columbia.edu/projects/iat/ http://www.carolina.com/lab-supplies-and-equipment/lab-microscope-slide-preparation/10322.ct http://www.microscope.com/education-center/how-to-guides/mount-slides/ http://histologylab.ccnmtl.columbia.edu/HistologyLabManual.pdf
Other Learning materials	Related videos & films

2. Facilities Required

Item	Resources
Accommodation (Classrooms, laboratories, demonstration rooms/labs, etc.)	Accommodation (Classrooms, laboratories, demonstration rooms/labs, etc.) 40 seats/ class room/ 20 seats/lab Computer access with data show and internet
Technology Resources (AV, data show, Smart Board, software,	Data show, Overhead projector
Other Resources (Specify, e.g. if specific laboratory equipment is required, list requirements	Models Microscopes

G. Course Quality Evaluation

Evaluation Areas/Issues	Evaluators	Evaluation Methods
Course evaluation	Student	direct
Student-faculty meeting	Faculty, Program Leaders	indirect
Departmental council discussions	Staff members	indirect
Discussion with the group of faculty teaching the same course	Peer Reviewer	indirect
Periodical departmental revisions of each method of teaching	Peer Reviewer	indirect

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	
Reference No.	
Date	