



## **Course Catalogue**

**Department of Biology (General)**

**College of Science**

**Salahaddin University-Erbil**

**Subject – Practical Microtechnique**

**Second Stage - Second Semester**

**Lecturer's Name: Dr. Chnar N. Fathulla**

**Assist. Lect. Azheen S. Abdulrahman**

**Academic Year 2023/2024**

## 1. General information

Course Title: Microtechnique

Department: Biology

Course Level: Undergraduate

Stage: Second stage

Class hour/week: Theory: 2hrs      Laboratory: 2hrs

Course type: Compulsory

Mode of Delivery: Face to Face

Language: English and Kurdish (Sometimes Arabic)

Course Coordinator:

    Theory Section: Dr. Chnar N. Fathulla

    Contact: Email: chnar.fathulla@su.edu.krd

    Laboratory Section: Azheen Subhi Abdulrahman

    Contact: Email: azheen.abdulrahman@su.edu.krd

Course Policy:

- Attendance: students are strongly encouraged to attend in class on a regular basis, as participation is important to understanding of the material.
- The use of mobile phone during the class is prohibited.
- Only the students who are officially enrolled can attend the class.
- Daily participation and conducting assignments are required
- Electronic devices: All cell phones are to be turned off or silent at the beginning of class and put away during the entire class and don't allow to use internet

The Course Keywords: Microtome, sectioning method, non-sectioning method plastic and paraffin block.

## **2. Course Description**

This course is designed to provide information about introduction to the microtechnique, methods in microscopic technique and different techniques for sample preparation. The material will be presented at a level suitable for advanced undergraduates by lecturing, discussion, video and power points.

## **3. Course Teaching and Learning Activities (Pedagogical Approaches)**

Various teaching style (Pedagogical methods) will be used during the course in order to reach the learning objectives of course to students: -

- a. Presentation - use data show and power point
- b. Lecturing method - oral presentation intended to present information to teach students about the topics
- c. Class discussion - exchange information between and among teachers and students with the purpose of developing students' ability to expanding students' understanding.
- d. Lab base model blending method - is a form of learning through practical experimentation.

## **4. Course Learning Outcomes**

After completion of this course, students will be able to: -

- 1) To increase each student's knowledge about the basic routine methods
- 2) To gain experience and understanding of basic histological techniques and other methods of cell visualization.
- 3) How to prepare different types (plants and animal specimens) of glass slides.
- 4) Preparation of the films, squashes and completely mounted slides.

## 5. Course Content

### Theory

1. Introduction and explaining the course book
2. All about Fixation, definition, significance, mechanism
3. Materials used in fixation, chemical and physical, postfixation
4. Washing, dehydration and clearing
5. Infiltration and embedding and types of embedding medium
6. Sectioning, types of microtomes, faults and remedy in sectioning
7. Staining, theory of staining, routine and special staining, types of staining and classification of stains and dyes.
8. Mounting and types of mounting media
9. Routine staining of animal and plant tissues
10. Methods used in preparing biological slides. sectioning and non-sectioning methods
11. Difference between light and electron microscope preparation methods
12. Histochemistry and immunohistochemistry
13. Light microscopic special techniques
14. Special electron microscopic techniques

### Practical

Date 2021	Weeks No.	Topics	Hrs.
	1	Introduction	2
	2	Non-sectioning methods 1. Stripping off method	2
	3	2. Blood smear	2
	4	3. Maceration and squashing Preparing of onion root tip for studying mitosis	2
	5	4. Whole mounting	2

	6	Histological preparation for light microscopy Paraffin method a. Animal dissection and fixation	2
	7	b. Dehydration, clearing and infiltration	2
	8	c. Blocking, trimming and sectioning	2
	9	First Exam	1
	10	d. Staining and mounting	2
	11	Histological preparation for electron microscopy plastic method a. Fixation and dehydration	2
	12	b. Clearing, infiltration and embedding	2
	13	c. Sectioning and staining	2
	14	Second exam	1
	15	Final-term Examination	

## 6. Course Assessment Tools

### Theory

Exam = 10 marks

Quizzes = 5 marks

### Practical

Assessment Tools	Descriptions	Weight
Quiz	Test during lecture	6
Home Work and Reports	A set of tasks assigned to students to be completed outside the classroom.	8
Activities and Seminar	Students participating during the lab and attendance	6
Mid-term examination	Students will have a written exam related to the previous laboratories	15
Total		35

## 7. Textbooks and References

- ✓ Suvarna, S.Kim 2013. Bancroft`s theory and practice of histological techniques. 7th edition.
- ✓ J.James 2011 Light microscopic techniques in Biology and Medicine. Springer.
- ✓ <https://www.sciencedirect.com/book/9780702068874/bancrofts-theory-and-practice-of-histological-techniques#book-description>
- ✓ Cell imaging techniques, methods and protocols. 2006 Humana Press Inc. Edited by Douglas J. Taatjes and Brooke T. Mossman.
- ✓ . Hameed A. Al-Hajj (1998): Light microscopic techniques theory and practice. Jordan Book Center
- ✓ Internet.

**Peer reviewed by:**

**Mr. Mohammed**

**Head of Department of Environmental Health and Science**