Lesson plan of Cell, Tissue and Organ Banks

دانشگاه علوم پزشکی تبریز
دانشکده علوم نوین پزشکی

Second Semester of the Academic Year 2023-2024

Instructor(s): Dr. Ahmad Mahdipour, Dr. Parviz Ranjbarrvan, and Dr. Nima Beheshtizadeh

Number of Units: 2
Type of Unit: 2 Theoretical Units
Level: PhD in Tissue Engineering

Number of Sessions: 17 Sessions

Start and End Date of Sessions:

Weekly Session Schedule: Wednesdays, 8:00 - 10:00 AM

Location of In-person Sessions: Classroom 3

Overall Goal and Introduction to the Course Unit:

Familiarity with banks and methods of preserving cells and tissues.

Overall Objectives of Sessions:

Familiarity with cryoprotectant materials, freezing and thawing methods, presentation of the principles and fundamentals of cryobiology, sterilization, liver bank. Familiarity with testicular tissue and sperm storage banks, familiarity with ovarian tissue and egg storage banks. Familiarizing students with heart valve banks, vascular banks, bone and connective tissue banks, skin banks, pancreas bank, eye bank, bone marrow stem cell bank, hematopoietic stem cell and umbilical cord banks.

Course Unit Educational Objectives

It is expected that learners, after completing this course, will be able to:
(The percentage of educational objectives should be written based on the latest relevant curriculum version, and it is recommended that at least 80% cover cognitive, affective, and psychomotor objectives.)

1. **Explain the principles and fundamentals of cryobiology.**
2. **Name cryoprotectant materials and state the function of each.**
3. **Know and explain freezing, thawing, and sterilization methods.**
4. **List international preservation and storage banks for heart valves.**
5. **List international preservation and storage banks for blood vessels.**
6. **List international preservation and storage banks for bone and connective tissue.**
7. **List international preservation and storage banks for skin.**
8. **List international preservation and storage banks for the pancreas.**
9. **List international preservation and storage banks for the liver.**
10. **List international preservation and storage banks for the eye.**
11. **List international preservation and storage banks for bone marrow stem cells.**
12. **List international preservation and storage banks for hematopoietic stem cells and umbilical cord.**
13. **Explain the objectives, reasons, and methods for storing testicular tissue and sperm.**
14. **Explain the objectives, reasons, and methods for storing ovarian tissue and eggs.**
15. **Explain the characteristics of a suitable tissue donor and state the contraindications.**
16. **Explain the methods of tissue transfer from the site to the bank.**
17. **List and explain routine tissue storage methods.**
18. **Be able to opine on selecting the best storage method for heart valves.**

Teaching Methodology

Methods, techniques, or models to be used for teaching the course topics in this unit. Lecture, Question and Answer, Discussion, Conference, Self-study, Case Presentation.

Student Assessment Method

The method of assessment during the semester and the final exam must be specified, mentioning the type of exam and the grade breakdown for each assessment component, including attendance, assignments, class participation, group work, quizzes, etc., must be clearly and transparently specified in this section.

Assessment During the Course: Class activities including seminar presentation, group work and quizzes, participation in class discussions, assignment completion (2 points)

Final Assessment: Written Exam (16 points)
Attendance: 2 points
Total Score: 20

Minimum Passing Grade for this Course: Based on the curriculum: 14

Permitted Absence Hours for this Course Unit: According to approved educational regulations: 8 hours

Educational Resources

Resources from which exam questions will be derived must be listed. If some resources are to be introduced to students for further study, their list should be provided separately below.

Eisenbrey AB. Tissue and Cell banking, An issue of clinics in laboratory medicine (Latest edition)

BrockbankKGM, Covault JC, TaylorMJ. Cryopreservation manual: A guide to cryopreservation techniques (Latest edition)

Educational Resources for Further Study

Exam questions cannot be derived from these resources. These resources are introduced solely to deepen students' learning.

Nather A, YusofN, Hilmy N. Radiation in Tissue Banking: Basic Science and Clinical Applications of Irradiated Tissue Allografts: Basic Science and Clinical Applications of Irradiated Tissue Allografts. Singapore: World Scientific (Latest edition)

Learning Opportunities

Introduction of potential and provided opportunities by faculty members of the department/university/other universities during the semester for further learning, including a list of workshops, webinars, conferences, journal clubs, etc., to learners.

- Attending class sessions
- Holding various specialized workshops in the department by faculty members and senior students
- Participating in the department's journal clubs

Contact Information

Course Instructor(s) (Phone, Email, etc.)

Dr. Mahdipour: 09141-77342 - a.mahdipour.te@gmail.com
Dr.Ranjbarvan: 09143-7176 - Ranjbarvan@gmail.com
Dr. Beheshtizadeh: 09355675643

Educational Specialist (Phone, Email, etc.):

Phone Ms. Mina Jasoor: 04133355790

Titles of Sessions for Cell, Tissue and Organ Banks Course

Session	Instructor	Date	Topic
1	Dr. Mahdipour	2025-05-21	Introduction and Course Overview
2	Dr. Mahdipour	2025-05-28	Principles of Cryobiology
3	Dr. Mahdipour	2025-06-04	Cryoprotectant Materials
4	Dr. Mahdipour	2025-06-11	Freezing and Thawing Methods
5	Dr. Beheshtizadeh	2025-04-09	Sterilization
6	Dr. Beheshtizadeh	2025-04-16	Liver Bank
7	Dr. Beheshtizadeh	2025-04-23	Familiarity with Testicular Tissue and Sperm Storage Banks
8	Dr. Beheshtizadeh	2025-04-30	Familiarity with Ovarian Tissue and Egg Storage Banks
9	Dr.Ranjbarvan	2025-05-07	Heart Valve Banks
10	Dr.Ranjbarvan	2025-05-14	Vascular Banks

Session	Instructor	Date	Topic
11	Dr.Ranjbarvan	2025-05-21	Bone and Connective Tissue Banks
12	Dr.Ranjbarvan	2025-05-28	Skin Banks
13	Dr.Ranjbarvan	2025-06-04	Pancreas Bank
14	Dr.Ranjbarvan	2025-06-11	Eye Bank
15	Dr.Ranjbarvan	2025-06-16	Bone Marrow Stem Cell Banks
16	Dr.Ranjbarvan	2025-06-18	Hematopoietic Stem Cell and Umbilical Cord Banks
17	Dr.Ranjbarvan	2025-06-28	Exam