بسمه تعالی In the Name of God

Hamadan University of Medical Sciences and Health Services
Educational Deputy of the University
Center for Studies and Development of Medical Sciences Education

Theory/Practical Lesson Plan Form

Dear Colleagues,

As the teaching-learning process is one that requires careful planning to achieve its objectives, the preparation of a lesson plan at the beginning of the educational process (as a map and guide for instructors and students) is essential. It serves as one of the main tools for the educational activities of instructors. Therefore, we kindly ask all instructors to pay utmost attention to completing the lesson plan.

Course and Instructor Details (Completing all items in this section is essential)

Course Information

Field	Details
Course Title	Practical Virology II
Instructor(s)	Dr. Ali Teimouri, Dr. Farid Azizi Jalilian, Dr. Nastaran Ansari, Dr. Shahab Mahmoudvand
Course Coordinator	Dr. Ali Teimouri

Head of Department	Dr. Ali Teimouri
Credit Hours	Practical: 2 units
Program & Level	Master's Degree
Semester	First Semester, Academic Year 2023–2024
Teaching Location	Faculty of Medicine, Department of Virology

Session-by-Session Syllabus (Practical — 2 Units)

Session	Topic(s)	Expected Learning Outcomes (Behavioral)	Learning Domain	Teaching Method(s)	Duration (hrs)	Teaching Aids	Assessment Method(s)
1	Cell Culture I	1. Types of cell cultures. 2. Applications of cell culture in virology. 3. Importance of cell culture in virology.	Comprehension, Analysis, Creativity	Discussion, Direct observation	2	PowerPoint, whiteboard	Laboratory report
2	Cell Culture II	1. Passaging of various cell types. 2. Methods for cell preservation. 3. Cell revival techniques.	Comprehension, Creativity	Discussion, Direct observation	2	PowerPoint, whiteboard	Laboratory report
3	Virus Culture	1. Principles of culturing different viruses. 2. Preparation of virus seed stock.	Comprehension, Analysis	Discussion, Direct observation	2	PowerPoint, whiteboard	Practical work
4	Viral Titration I	1. Principles of viral titration. 2. $TCID_{50}$ viral titration method. 3. Calculations based on various equations.	Comprehension, Analysis	Discussion, Direct observation	2	PowerPoint, whiteboard	Practical work

5	Viral Titration II	1. Plaque assay method for viral titration. 2. Viral plaque staining. 3. FFU assay for viral titration.	Comprehension, Analysis	Discussion, Direct observation	2	Video, whiteboard	Laboratory report
6	Hemagglutination (HA) Assay	1. Principles of HA assay. 2. Applications of HA assay in virology. 3. Determination of viral titer using HA assay.	Comprehension, Analysis, Creativity	Discussion, Direct observation	2	Whiteboard, PowerPoint	Laboratory report
7	Virus Neutralization Test	1. Principles of virus neutralization. 2. Applications of neutralization tests. 3. Interpretation of results. 4. Classical VNT (cVNT). 5. Hemagglutination inhibition (HI) assay.	Comprehension, Analysis	Discussion, Direct observation	2	Video, whiteboard, PowerPoint	Laboratory report
8	qPCR I	1. Principles of qPCR. 2. Qualitative qPCR methods and their applications in virology. 3. Absolute and relative quantitative qPCR.	Comprehension	Discussion, Direct observation	2	Video, whiteboard, PowerPoint	Laboratory report
9	qPCR II	1. Standard sample calculation. 2. Interpretation	Comprehension, Analysis	Discussion, Direct	2	Video, whiteboard	Q&A

		of standard curves.		observation			
10	DNA Transfection & Transformation	1. DNA delivery into eukaryotic cells. 2. DNA delivery into recombinant bacteria. 3. Tracking transfected plasmids using reporter genes.	Comprehension, Analysis	Discussion, Direct observation	2	Video, whiteboard, PowerPoint	Q&A
11	Viral Vectors	1. Introduction to lentiviral vectors. 2. Introduction to adenoviral vectors. 3. Applications of viral vectors in virology.	Comprehension, Analysis	Discussion, Direct observation	2	Video, whiteboard, PowerPoint	Q&A
12	Immunofluorescence	1. Principles and applications of immunofluorescence in virology. 2. Introduction to fluorescent-labeled antibodies (direct & indirect). 3. Sample preparation. 4. Interpretation of images.	Comprehension, Analysis	—	2	Video, whiteboard, PowerPoint	Laboratory report
13	Gene Cloning I	1. Overview of different vectors. 2. Restriction enzymes and their	Comprehension, Analysis	—	2	Whiteboard, PowerPoint	Simulation

		applications. 3. Principles of gene cloning in prokaryotic vectors.					
14	Gene Cloning II	1. Gene cloning applications in eukaryotic vectors. 2. Principles of cloning in eukaryotic vectors. 3. Methods for confirming cloned genes in plasmids.	Comprehension, Analysis	—	2	Whiteboard, PowerPoint	Simulation
15	Genomic Databases	1. Overview of genomic databases. 2. Principles of sequence alignment. 3. Using software for genomic data analysis.	Comprehension, Analysis	—	2	Video, whiteboard, PowerPoint	Laboratory report

Grading Scheme (Total: 20 points)

Assessment Type	Date	Assessment Tool	Points
Final Exam	Jan 25, 2024	Written descriptive exam	10
Other (Q&A and group participation)	Throughout semester	Oral Q&A, group discussion on course topics	10
Total	—	—	**20**

References

1. **Virology Methods Manual** — primary practical reference.