Department of Plant Protection

College of Agriculture

University of Salahaddin - Erbil

Subject: Plant Virology - Practical

Course Book – For Stage 3

Lecturer's name: MSc Karzan Kazm Mahmud

Academic Year: 2017/2018 Spring Semester.

Course Book

1. Course name	**Plant Virology - Practical**
2. Lecturer in charge	**KARZAN KAZM MAHMUD**
3. Department/ College	**Plant Protection, Agriculture College**
4. Contact	**e-mail: karzan.mahmud@su.edu.krd** **Tel: (00964 750 452 30 86)**
5. Time (in hours) per week	**Practical: 3**
6. Office hours	**9 hours**
7. Course code	
8. Teacher's academic profile	**I have graduated in the University of Salahaddin in 2008-2009, and I got BSc. in Plant protection department – college of Agriculture. Then I have got MSc. (in Biotechnology in Plant Virology) in Sheffield Hallam University - UK– 2014. During studying in the UK, I have published three formal papers and one informal paper regarding my academic works. Now I am assistant lecturer in Plant protection department – Agriculture college.**
9. Keywords	**Plant Viruses and Viroids, their Properties, transmission methods, identifications of them**

10. Course overview:

This practical lecture will focus on several areas regarding to Plant viruses and viroids with their characteristics, their disseminations and how can be transmitted.

- The importance of studying this subject is to learn perhaps the ways of identification of plant viruses and viroids, and their transmission methods.
- Understanding of the fundamental concepts of the course are (to make students to be familiar with all most all techniques and methods of identifications of plant viruses and viroids with their transmission methods theoretically and practically).
- Principles and theories of the course (identification of plant viruses and viroids genetically and morphologically, doing a small research project and show them their transmission methods, show them how viruses and viroids can be seen from electrophoretic methods, show them some plant viruses and viroid symptoms with their identifications.

▪ By taking this course, students could be learned how plant viruses and viroids can be identified genetically and symptomatically, and plant viruses and viroids can be disseminated with their limitations. Students perhaps be learned how plant viruses and viroids can be transmitted from an infected plant to a susceptible plant, and why learning transmission methods are essential in plant virology, then how can be performed practically to identify plant viruses and viroids. This course could make students to learn transmission methods of plant viruses and viroids practically especially mechanical transmission method, and how they can be identified practically.

11. Course objective:

- Try to make students to be familiar with major plant virus and viroid diseases those are commons in Kurdistan.
- Attempt to make students to be familiar with transmission methods of the plant viruses and viroids those cause diseases on plants in Kurdistan.
- To make students to be familiar with some techniques for identifications and diagnosis of diseases symptomatically and genetically.
- Tray to show them the most popular symptoms of plant viruses and viroids especially are common in Grdarasha field.

12. Student's obligation

During taking this course, students will be asked to be attended all practical lectures and scientific trips. They will be required to conduct a small research project with its report regarding the course concepts and taking two different examinations. The first one is phase test which the questions will be given to the students in 3 weeks before taking the exam. The second type of exam will be a PowerPoint (slides) that will be in secret. This course includes two scientific trips, and a report has to be prepared by the students in each trip.

13. Forms of teaching:

During delivering this course several items will be utilised for getting to the students easily which are;

1. **PowerPoint.**
2. **White board.**

3. **Videos regarding the lessons.**
4. **Pictures.**
5. **Occasionally recording practically lectures for applying methods and techniques.**

14. Assessment scheme:

Grade distribution of 15%

Test	Mark 15%
1st Exam = Phase test	5
2st Exam = PowerPoint	5
Quiz + Plus Marks	2
Small research project	3
Total	15

Final examination out of (60%)

Monthly exam	Mark%
Theoretical exam	40
Practical exam	20
Total grade	60

15. Student learning outcome:

Students will be able to:

1. Learn the majority points regarding the Plant virology.
2. Learn main concepts of Plant virology.
3. Learn the all most all steps and techniques of Plant virus and viroid transmission methods.
4. Identify plant viruses and viroids symptomatically and perhaps genetically by using variety tools.
5. Learning the importance of mechanical transmission regarding identification of plant viruses and viroids, etc….
6. Be familiar the most importance techniques and methods of plant virus and viroid identifications.
7. Be familiar with separation and differentiation of plant viruses and viroids
8. Be familiar that how plant viruses and viroids have been discovered and classified.
9. This course will make students to be learned the modern techniques for protecting plants and cure them without using chemical substances.

16. Course Reading List and References:

- AGRIOS, Georg N., (2005). *Plant pathology*, 5th ed., London, Elsevier academic.
- NAVARRO, B. and FLORES, R. (1997). Chrysanthemum chlorotic mottle viroid: Unusual structural properties of a subgroup of self-cleaving viroids with hammerhead ribozymes. *Proceedings of the National Academy of Sciences of the United States of America,* **94** (21), 11262-11267.
- MOLINA-SERRANO, D., SUAY, L., SALVADOR, M. L., FLORES, R. and DAROS, J. A. (2007). Processing of RNAs of the Family *Avsunviroidae* in *Chlamydomonas reinhardtii* Chloroplasts. *The Journal of Virology,* **81** (8), 4363-4366.
- RUSSELL, G.E.(1978). *Plant breeding for pest and disease resistance*. Butterworth.
- MARTINEZ DE ALBA, A. E., FLORES, R. and HERNANDEZ, C. (2002). Two Chloroplastic Viroids Induce the Accumulation of Small RNAs Associated with Posttranscriptional Gene Silencing. *The Journal of Virology*, **76** (24), 13094-13096.
- Scholthof, K-B. G. 2008. Tobacco Mosaic Virus: The Beginning of Plant Pathology.

17. The Topics:	**Lecturer's name**
Background of plant virology and the differences between viruses and viroids It is the introduction practical lecture all basic and reminding information regarding the plant virology will be delivered.	Karzan K Mahmud (3 hrs) First week

Main symptoms of plant viruses and viroids with their properties Students who are taking this practical lecture should know the symptoms of plant viruses and viroids and their characteristics.	Karzan K Mahmud (3 hrs) second week
Transmission methods of plant viruses and viroids I. Students who are taking this practical lecture should be learned some of the transmission methods of plant viruses and viroids theoretically and practically.	Karzan K Mahmud (3 hrs) Third week
Transmission methods of plant viruses and viroids II. Students who are taking this practical lecture should be learned some of the transmission methods of plant viruses and viroids theoretically and practically.	Karzan K Mahmud (3 hrs) fourth week
Transmission methods of plant viruses and viroids III. Students who are taking this practical lecture should be learned some of the transmission methods of plant viruses and viroids theoretically and practically.	Karzan K Mahmud (3 hrs) fifth week
Extraction and Purification methods of plant viruses and viroids I. All techniques and methods of isolation and purification of plant viruses and viroids will be explained to the students theoretically and practically or by pictures and videos with explaining the importance of them regarding the identifications.	Karzan K Mahmud (3 hrs) sixth week
First exam & Extraction and Purification methods of plant viruses and viroids II One hour of the practical lecture will be spent with the phase test exam and two hours will be spent for	Karzan K Mahmud (3 hrs) seventh week

completing the previous practical lecture.	
The requirements for detections and identifications of plant viruses and viroids In this practical lecture, how plant viruses and viroids can be identified and what are needed for their detections and identifications.	Karzan K Mahmud (3 hrs) Eighth week
Scientific trip Students will be taken to the Grdarasha field for show them some symptoms of plant viruses and viroids for doing mechanical transmission of them.	Karzan K Mahmud (3 hrs) Ninth week
Preservation of Plant viruses and viroids In this practical lecture, the methods of preservation will be delivered and conducted one method of them practically.	Karzan K Mahmud (3 hrs) Tenth week
Molecular and genetic identifications of plant virology I All techniques and methods that are required for identifications of plant viruses and viroids will be explained	Karzan K Mahmud (3 hrs) Eleventh week
Molecular and genetic identifications of plant virology II The previous practical lecture will be completed	Karzan K Mahmud (3 hrs) Twelfth week
Scientific trip	Karzan K Mahmud (3 hrs)

Students will be taken to some crops to show them the symptoms of plant viruses and vioirds on the crop plants	Thirteenth week
Management of plant virology.(conventional approach and biotechnological approach) I. The methods and techniques that can be used for reducing the efficacy of plant viruses and vioirds will be explained to the students.	Karzan K Mahmud (3 hrs) Fourteenth week
Management of plant virology.(conventional approach and biotechnological approach) II. The last practical lecture will be completed.	Karzan K Mahmud (3 hrs) Fifteenth week
Second exam & Revision The second monthly exam will be taken and the rest of the time will be spent for revision of all practical lectures of Plant virology.	Karzan K Mahmud (3 hrs) Sixteenth week

18. Examinations:

- Which techniques do you use for extraction and purification of plant viruses and viroids? Why?
- Which technique is more accurate for screening and detection of extracted viruses and viroids? Why?
- What are the differences between plant viruses and viroids?
- How many plant viruses are discovered so far and how are they classified?
- How plant viruses and viroids can be identified by mechanical transmission?
- Mention the main symptom of this disease that can be distinguished from the others?
- Mention the main differences between each type of symptoms?
- Write the name of this disease and characteristics of the causal agents?

19. Extra notes: **There is no any extra comment or notes.**
20. Peer review .