

BIOL 731, Virology Laboratory

TUESDAY 1:30-5:20, Ackert Hall 121

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Course Objectives:

This laboratory course is primarily designed as a research project; that is, you will be working on completing a *real* research project, collecting actual data, throughout the semester. In the course of completing this project, you will learn several techniques used to study viruses and the theory behind them. For most of the course we will be using one particular virus, but the basic protocols used are similar to those used with any virus. Most of all, we hope you have fun!

Grading:

There will be a total of 200 possible points in this course. These will consist of 3 notebook evaluations worth 25 points *each*, a final paper worth 100 points, and 25 technique points. Thus, the final paper counts for 50% of your grade, the notebook evaluations 37.5%, and technique points 12.5%. Final letter grades will be assigned as follows: 90-100%, A; 80-89%, B; 70-79%, C; 60-69%, D; and below 60%, F.

Notebook Evaluations. You will be required to maintain a laboratory notebook during the semester. In these notebooks you should record the experiments you perform, including the date, purpose, general procedure, raw and analyzed results, and discussion. Three times during the semester you will be asked to turn in your notebooks for evaluation. You will be awarded from 0 to 25 points each time. Notebooks will be evaluated based on completeness, clarity, and neatness. Note that you should write in your notebooks using a pen as you are performing the experiment, if you make an error, crossing over it with one line is fine. Since the evaluations will not be announced ahead of time, you will need to keep your notebook up to date.

Final Paper. Towards the end of the semester you will write up the experiments you have performed during the semester in the form of a scientific paper, including a Title, Abstract, Introduction, Materials and Methods, Results, and Discussion. You are encouraged to start working on this paper early so that you can turn it in for comments two weeks prior to the final due date. At that time the instructors will go over your paper and make suggestions for improvement, and you will be able to make improvements prior to handing in the paper for grading on the final day of class.

Technique points. At the end of the semester the instructors will assign between 0 and 25 points based on our observations of your techniques over the course of the semester. Lab safety is a major part of this evaluation!

Required materials:

You are required to purchase a bound laboratory notebook at the Union Bookstore. In addition, there will be a lab manual that you will need to purchase at Clafflin Copy Center called "Exercises in Molecular Virology". Since this laboratory involves complicated procedures and a limited amount of time to complete them, it is essential that students familiarize themselves with the lab protocols **before** coming to class. We reserve the right to start giving pop quizzes (and adjust the course grading scheme appropriately) if we notice that students seem unprepared.

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Schedule of Exercises, Spring 2004

Week 1	Jan. 27	Virology lab check-in & introduction to cell culture techniques Dilution exercises	p. 5 Appendix I
Week 2	Feb. 3	Transfection to construct recombinant virus	Appendix II & p. 12
Week 3	Feb. 10	Plaque assay to titer transfection	p. 17
Week 4	Feb. 17	Plating virus for plaque screening	p. 22
Week 5	Feb. 24	Plaque screening and plaque purification I	p. 23
Week 6	Mar. 2	Plaque purification II	p. 23
Week 7	Mar. 9	Plaque purification III	p. 23
Week 8	Mar. 16	Virus scale-up I	p. 25
	Mar. 23	Spring break	
Week 9	Mar. 30	Virus scale-up II	p. 25
Week 10	Apr. 6	Purification of baculovirus DNA Chemotaxis experiment	p. 27 p. 30
Week 11	Apr. 13	Analysis of baculovirus DNA Infections with recombinant viruses	p. 32 p. 36
Week 12	Apr. 20	Protein gels: staining and transfer	p. 38
Week 13	Apr. 27	Immuno-detection <u>Turn in papers for comments</u>	p. 43
Week 14	Apr. 4	Purification of virus by sucrose gradient	p. 45
Week 15	May 11	Electron microscopy of viruses <u>Final paper due</u>	p. 50

Any student with a disability who needs an accommodation or other assistance with this course should make an appointment to speak with the instructor as soon as possible.

It is expected that all academic work in this class be done individually. Do not collaborate on any academic work unless specifically approved by your instructor. On all assignments, examinations, or other course work, the following pledge is implied, whether or not it is stated: "On my honor, as a student, I have neither given nor received unauthorized aid on this academic work." For more information, please visit the Honor System web page at <http://www.ksu.edu/Honor>.