

**CEDAR CREST COLLEGE**  
**Reese Laboratory Research Syllabus Policies**

**I. Research Advisor Information:**

**Advisor:** Dr. Amy J. Reese  
**Office:** Science Center 110  
**Phone:** 610-437-4471, x3517  
**Email:** ajreese@cedarcrest.edu  
**Office hours:** Weekly lab meetings every Friday at 1:15 – 2:30 and by appointment.  
**Website:** <http://www2.cedarcrest.edu/academic/bio/areese/>

**II. Course Descriptions & Prerequisites:**

1. These research courses involve student participation in my research program and should be considered an opportunity. They may fulfill a research requirement for some science majors.
2. **BIO 243:** I usually design these projects. They may be parts of current projects, general lab projects, or exploratory lab projects. One credit of research may be recommended at this stage. Req: successful completion of BIO 121 and BIO 122 and/or my permission.
3. **BIO 353:** These research projects are generally BIO 350 proposals that are being carried out in the laboratory, adapted as needed and guided by me. Taking two credits of research is most common and is preferred, but one may be appropriate in some cases. Req: successful completion of BIO 121 and BIO 122, BIO 227, Bio 350 and my permission.
4. **BIO 354:** For this course, you write a thesis detailing your Bio 353 work and present your final project at a biology department seminar talk or poster. Biology thesis is not required and is separate from research BIO 353. Bio 354 requires completion of four credits of BIO 353 (two may be concurrent) and my permission. If you are doing a thesis, we should meet to outline it in the fall of your senior year.
5. **HONORS:** If you are also doing an Honors thesis, you would register for both BIO 353 and BIO 354 for zero credits while registering for Honors thesis for credit (for both semesters). The Honors component of your project must also reflect cross-disciplinary information.

**III. Objectives and Goals:**

1. The objectives of research in this lab are to help prepare you for the work of graduate school, technical, pharmaceutical, laboratory or other work and to expose you to the questions of scientific research, the mechanisms of scientific experiments, analysis and communication.
2. As a member of my research lab, you are responsible for:
  - a. a research project that is independent (except for Bio 243 students) from others
  - b. communication with me about your laboratory work
  - c. project notebook and sample maintenance
  - d. attendance of research meetings
  - e. presentation of research progress both informally and formally
  - f. participation in laboratory up-keep, clean-up, & protocol maintenance
  - g. reading preparation and presentation of literature as outlined
  - h. constructive interactions with labmates

3. The goal of your research in the lab is for you to design, carry out, interpret, trouble-shoot, and communicate scientifically sound research on a microbiology-related project with my guidance and the constructive feedback from the laboratory group and the Cedar Crest College Department of Biological Sciences.

#### **IV. Course Outcomes:**

1. You should develop critical thinking laboratory skills in the design and analysis of your experiments. This ability will be assessed through the evaluation of progress reports, lab participation, presentations, and lab notebooks.
2. You should learn to apply your general lab and research skills to new problems and concepts by reading and sharing learned material from current research literature and by discussing your project with others.
3. You should learn to select, follow, and adapt basic protocols for the methods required by your research projects. You must consider appropriate controls and how to draw conclusions from your experiments.
4. My hope is that you will be exposed to the intrigue of scientific research and that you will feel a part of a research team.

#### **V. Attendance & participation:**

1. I want to begin the semester with a one-on-one meeting to plan for the semester and to end the semester with a similar one-on-one meeting to summarize the semester and exchange feedback. We'll also do a mid-semester check to evaluate how things are going.
2. I expect you to consider research as another one of your courses. Put lab work time into your schedule as you would a class. I expect 353 students spend a minimum of six hours per week working in the lab, attending lab meetings, searching the literature, or reading papers/protocols in order to obtain an average grade. Lab effort is important. Project progress is even better. While lab meetings and outside reading preparation may count towards your total weekly hours, you will certainly need to be in lab each week as well. I recognize that some weeks (especially early on) may involve more outside planning and reading time than others.
3. Plan on attending lab meetings and let me know if you will need to miss them. If you have a course conflict, you may be asked to register for only 1 credit to excuse you from meetings or we may work out an alternative meeting time. I expect you to participate in lab meetings by asking questions of your colleagues, sharing your work, or presenting/discussing journal articles as relevant to each meeting. The meetings are to facilitate our communication since we can't all work in the lab at the same time. We may also schedule individual or sub-group meetings for those working on similar projects as needed throughout the semester.
4. Each semester we will have several joint lab meetings with the Walther lab. These will be opportunities for more senior lab members or those with more completed projects to present formal presentations.
5. In addition to our regular weekly meetings, there will be departmental research meetings two times a month or every other week at which Bio 353 students are expected to present their work. This will allow for regular feedback before students reach their senior research presentation.
6. You may have the chance to submit and present your work at a local, regional, or even national meeting. These are special opportunities and should be treated as such.

## **VI. Progress reports:**

1. The purpose of the bi-weekly progress reports is to help you monitor and follow your work, to establish lab accountability, and to incorporate feedback from sharing this information at lab meetings. These are due every other week from each lab member, unless otherwise discussed.
2. Ideally these reports would be the starter material for a “round table” discussion where each student reports her progress or issues for the past two weeks as we go around the group. This allows us to identify universal lab issues, help each other, and follow each other’s progress. I expect you to add relevant comments and for us to talk about what’s next so that you leave the meeting with a plan (or follow up meeting as necessary) for the next steps. The purpose of these isn’t simply paperwork for each of us, but rather as a “talking point” for further discussion.
3. The progress report is available on the Reese lab website, from me, and in the lab manual. It can be mostly completed on the computer (which could aid in later report writing) or by hand. You can also satisfy the report questions by answering the questions below.
  - a. On what experiments were you working & what did you accomplish the last 2 weeks?
  - b. What methods did you use for these experiments? Where there appropriate controls?
  - c. What were your results and what did you interpret from them?
  - d. Did you have to do any troubleshooting?
  - e. What are your plans for the next few weeks?
  - f. How did you contribute to overall Reese lab citizenry?
  - g. What were the strengths or skills gained?
  - h. How many hours did you spend in the lab this past two weeks? When?
  - i. Were there any suggestions or comment from lab meeting?

## **VII. Literature reading:**

1. You should be reading appropriate literature for the background and methods associated with your specific research topic and keeping an annotated bibliography. You may write a paragraph summary of what you read or you may use the literature guide (on-line, in the Reese research lab manual, and listed below) to help you in your mini write-up. These should be typed up and put into your lab notebook or into a separate journal notebook. The literature guide questions are:
  - a. What paper did you read (full reference information)?
  - b. What questions were the researchers asking?
  - c. What method(s) did they use to address the questions?
  - d. What type of data did they acquire?
  - e. What conclusions did they make? Were they supported by the data?
  - f. What questions were you left with?
  - g. How does the paper relate to your research project?
2. If you are in Bio 243, I expect you to read at least one paper (or protocol etc. as appropriate) per week. If you are in Bio 353, I expect you to read two pieces per week. If you are doing a thesis, this will be very helpful. You should turn in your annotated bibliography (see point 1 above about formats) with your notebook at the end of the semester that includes writings about each of these pieces.
3. At least once a semester we will have a lab meeting in a computer room. This will allow each of you to search the literature for the latest papers pertaining to your topic. I would expect us to share information about abstracts we find. This also allows us to also discuss terms and issues that you may not understand. Ideally, this day would be early in the semester and would help you find papers that you would be able to read the rest of the semester.

4. There are several papers in the filing cabinet in OBC2. These are organized by category to help you find ones that may interest you. If you find a paper to add, please discuss this with Dr. Reese or the lab work study person so that it can be added to the Zotero electronic system and added to our physical record.
5. A few times each semester, I may provide papers interest that you are to read before the assigned day and that we will discuss as a group.

### **VIII. Final Reports & Meeting:**

1. Each semester you should update and submit to me your project introduction so that you are keeping on top of it as you add more information and references. This is part of your final report.
2. At the end of the semester, I'd like to meet at the end of the semester to review progress, notebooks, literature reviews, and discuss your grade. There is a semester end form available from the Reese lab website, from me, and in the lab manual. I'd like you to fill it out before we meet and for you to bring your notebook and literature reviews then too.
3. If you are graduating, you must also sort through your samples, remove anything unneeded, provide a detailed list of what is saved, and give me a tour of your samples.

### **IX. Lab research presentations:**

1. Throughout the semester, you may be asked to present various types of updates of your research project. These may include more formal or "semi-formal" 15-30 minute powerpoint presentations, 5 minute "chalk-talk" presentations, or weekly updates.
2. If you formally present your research to both the Reese and Walther labs or to the Dept. of Biological Sciences, these presentations should be fifteen to twenty minutes in length. Draft/practice talks should be shared with Dr. Reese one week before your presentation.
3. After presentations, presenters should expect questions from the other lab students and me. This is practice for other departmental or conference presentations and will play a role in your satisfactory semester progress grade component.
4. All Bio 353 students are expected to attend the department seminar series on Friday afternoons. Bio 243 are also invited to these presentations.

### **X. Laboratory notebooks:**

1. You are required to keep a lab notebook. As is research tradition, this is property of the lab. At any point during the semester, I might need to check notebooks for what students are doing and how. Points will be deducted if I need to check your notebook and cannot find, or follow it.
2. As the notebook is lab property, the lab will provide the bound volumes for you to use. They are in the notebook drawer. You should also keep a separate set of your own lab manual notes & guides. If you want notes to take with you when you graduate, you may copy your notebooks.
3. See the lab manual (or your equivalent notes) on details for keeping a notebook.
4. You may also wish to keep a separate composition notebook for your own use (and not particularly associated with your project) in which you can collect useful tips about how to find and use things in the lab, additional protocols, practice calculations, and so on. These would be yours to take with you later.

## **XI. Laboratory resources:**

1. In addition to the links off of my website, there are a number of resources in the filing cabinet by our research area. Please take the time to explore these!
2. On top of the filing cabinet you will also find the Reese Lab Manual, a Protocol Notebook, and a notebook of Media and Plating Methods. I will continue to update these over time.
3. The computer and equipment in the lab is organized and labeled. Our materials and sample libraries are kept in the Bento program. Please refer to your copy of the lab manual.
4. Journal articles are being maintained in the lab in the filing cabinet. There is also an electronic tracking system (Zotero) that I recommend you each subscribe to. Please refer to your copy of the lab manual for further details.

## **XII. Lab citizenship:**

1. Be certain to sign the OBC2 safety document each semester. You will be given room access.
2. Part of being in a lab group is working with the rest of the group, learning from other students, helping teach other students, keeping the lab safe, and keeping the lab running efficiently. Contributions can be recorded in the lab progress reports. Severe violations of the lab citizenship policy (behavior that gets in the way of a constructive and productive lab environment) are sufficient grounds for being released from research.
3. The “Research and microbiology lab assistant manager” position may be filled, but you are also responsible for laboratory maintenance. In addition to doing your own dishes whenever possible, you may be asked contribute tasks toward general tasks might including: monitoring general lab aliquots and replenishing as needed, monitoring sterile cabinet supplies, stocking DNA gel buffer and monitoring the DNA electrophoresis station, monitoring the protein electrophoresis materials, dealing with issues of tip boxes, disposal of waste materials, making of media, lab housekeeping duties, general dishwashing & cabinet stocking, or lab protocols. Lab protocols should always be verified by Dr. Reese before added to the lab binders.
4. Research and microbiology lab assistant manager job description: Manage the [Reese] research laboratory’s electronic, filing cabinet, and other resources; track items that need to be ordered, refilled, or prepared; track stocking of sterile cabinets; housekeeping chores; clerical duties; errands; dishwashing; media preparation & autoclaving duties; train research students on basics of the research laboratory. Assist in preparing and restocking items used during 227 microbiology lab course work. Course in microbiology is preferred; must understand aseptic techniques and microbiology materials. Reliability critical. Good communication, organizational and teaching skills essential. Communicate with the forensic science faculty, staff, and work study student(s) to ensure constructive use of the room and resources.

## **XIII. Satisfactory semester progress & grading policies**

1. In addition to weekly group meetings, we can meet individually or in sub-groups.
2. Research grading will take into consideration the following: lab attendance, participation and citizenship, progress reports, literature discussions, annotated bibliography, presentations, semester progress & sample/notebook keeping.
3. A grade of “A” is not a given in research, but rather you are expected to earn a grade.

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Date	Agenda focus –
Friday, Sept 2 OBC lounge and OBC2 lab 1:15-2:15	- Introductions, sharing of summer activities - Presentation and discussion of lab manual - Lab tour of resources - Gather contact information and when folks plan to do research
Friday, Sept 9 OBC lounge 1:15-2:15	- Semester plan due (meet w/ Dr. Reese as needed) - Each student will present an informal chalk-talk of her semester project goals & method plans for the rest of the lab
Friday, Sept 16 <b>Miller 20</b>	- Search for abstracts/papers relevant to your project in the computer room, group project discussions as needed
Friday, Sept 23 OBC lounge 1:15-2:15	- Project report 1 due, “round table” discussion about projects and progress
Friday, Sept 30 OBC lounge 1:15-2:15	- Journal club
Friday, Oct 7	- NO MEETING – Friday before Fall break. - Meet individually with Dr. Reese for mid semester review.
Friday, Oct 14 <b>OBC2 lab (5K event)</b>	- Lab techniques -
Friday, Oct 21 OBC lounge 1:15-2:15	- Progress report 2 due, “round table” discussion about projects and progress
Friday, Oct 28 OBC lounge 1:15-2:15	- Senior practice presentations -
Friday, Nov 4 OBC lounge 1:15-2:15	- Joint meeting with Walther lab - Progress report 3 due
Friday, Nov 11 OBC lounge 1:15-2:15	- Joint meeting with Walther lab -
Friday, Nov 18 OBC lounge 1:15-2:15	- Joint meeting with Walther lab - Progress report 4 due
Friday, Nov 25	NO MEETING - THANKSGIVING BREAK
Friday, Dec 2 OBC lounge 1:15-2:15	- Plan lab holiday décor & schedule end of semester meetings - Discuss end of semester reports
Friday, Dec 9 OBC lounge 1:15-2:15	- Probable day of Dept. end of the semester holiday party - Discuss plans for next semester
TBD	- Senior presentations