Mountain Lake

Biological Station

Research Experiences for Undergraduates Program

Student and Mentor Handbook

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This handbook available on line at:
mlbs.org/download/MLBS_HandbookREU.pdf

I. THE PROGRAM

The *Research Experiences for Undergraduates (REU) Program* at the Mountain Lake Biological Station is funded by the National Science Foundation and is designed to fully involve undergraduates in the research enterprise of first-rank scholars in ecology, behavior, evolution and population biology. The program has allowed the station to form a community of undergraduate researchers within the already established community of scientists. We expect all of our undergraduate researchers to emerge as scientifically literate citizens, and we further expect that many of them will enter doctoral programs and eventually pursue careers as productive scientists. We achieve these goals by providing promising undergraduates with: (1) highly qualified mentors (2) formal seminars on the conduct of research and the development of professional skills and ethics, and (3) research experiences that guide a student through the planning, execution, analysis, interpretation, and presentation phases of a research project. Above all, we strive to make your REU experience rewarding and a lot of fun!

The following two sections are aimed at students and mentors respectively. However, you will profit from reading the full document.

II. FOR UNDERGRADUATE (REU) RESEARCHERS

You are expected to spend a total of 10 weeks in residence at the Station. Research schedules can be very demanding. Expect to spend well in excess of a normal "40-hour/5-day week" on your work. During that time you will:

1) Plan and execute an independent research project under the supervision of a mentor chosen from the researchers in residence at the station. We anticipate that at least 50% of your time at the station will be devoted to activities directly related to your project.
2) Participate in other research activities in your mentor's lab.
3) Participate in the REU seminar series.
4) Attend the Tuesday and Thursday night seminars presented by researchers in residence at the station and visitors to the station.
5) Enjoy the attractions of the southern Appalachians including hiking, mountain biking, and canoeing.

The Project

1) *The Proposal*: During your first two weeks at the station, you will work closely with your mentor to design a project that will potentially yield publishable results. Since good science often thrives on collaboration and interaction among researchers, you will develop a research proposal that you will deliver orally to the entire station. You will then use the input you obtain from your presentation to write a formal research proposal.

2) *Execution of the Project*: Each project will, to a certain extent, define your work schedule for the summer. Your research proposal should include a timetable that outlines the tasks that must be completed in order to finish the project and when you will accomplish each task. Once you establish the timetable for your project, you should consult your mentor in order to determine the extent of your participation in the mentor's other projects. We encourage you to trade field and laboratory help with other students in the program and to take advantage of recreational opportunities in the area. However, you should consult your mentor before you make commitments to such activities. Most researchers (undergraduate and otherwise) at the Station work 6 to 7 days each week, and 10 - 12 hours per day.

3) *The Final Report*: You should plan to end your data collection at least 10 days before your departure date. Your mentor will help you analyze and interpret your data. During the last week of your stay at the station, you will present a 15-minute oral report on your research as part of the REU Symposium. You will write a formal scientific report (in manuscript format) on your project and, upon approval by your mentor, you will submit this report to the REU Coordinator. Your *Final Report* abstract will be "published" on the MLBS

web site. ***You must submit your final written report to the REU coordinator before you leave the station, and before you receive your last stipend check.***

4) *Field and Lab Cleanup*: Before you leave the station you must clean your workspace in the lab and dispose of any samples that your mentor does not plan to save. Flagging and other research paraphernalia must be removed from your field plots. If your mentor anticipates that you will continue the study after the end of the summer season, you should register the locations of your plots and your flagging colors with the Associate Director. Unregistered flagging is routinely removed during the fall and winter.

5) *Acknowledgement:* The NSF requires that any publication resulting from, or including, work supported by the MLBS REU-Sites program include the following acknowledgement: *"This material is based upon work supported by the National Science Foundation under Grant No. 0453380."* [or current grant number, see REU web page for updates.]

The REU Seminar Series

The REU seminar meets once a week throughout the 10-week period and serves as a mechanism for the undergraduate researchers to interact with each other as they learn about the scientific process. Topics covered include research design, data management and reduction, an introduction to inferential statistics, and guidelines for oral presentations and written reports.

In addition to these weekly plenary meetings, the REU Coordinator also provides workshops on the use of computer software for data entry, analysis, and other special topics. The series also includes discussions on how to select and apply to graduate school and on ethical issues pertinent to the field sciences.

Finances

Students supported on the station's NSF-REU funds will receive their stipend in two installments throughout the summer. The final check will be held until the final report is submitted at the end of the program in mid-August. Checks will be mailed to the Station and distributed by the Station Office or the Coordinator. Room and board charges for the 10 weeks of the program are paid directly by the Station; not charged to students. Students residing at the Station for longer than 10 weeks may be responsible for the additional Room and Board charges. Discuss this with your mentor if the additional stay is mandated by the project.

Taxes: The REU stipend is considered a "scholarship." You will not receive a W-2 form and no taxes of any kind will be withheld. These facts do not mean you may not be legally required to report the scholarship as income. We cannot advise you on whether or not to report the scholarship; 1) because we do not know the ever-changing tax law, and 2) the University is not permitted to give tax advice. For current and accurate information, call the IRS help-line at 800-829-1040, or consult a qualified tax advisor.

Note: If you are supported by funds other than the Station's NSF/REU-Sites grant (such as an REU Supplement to your mentor's NSF grant, or any other form of stipend, wage or salary) you should consult your mentor to determine the financial specifics (e.g. room and board?) and the schedule of payments. The Station does not administer such funds.

While in residence at the station, you may charge personal supplies to an account. All accounts must be paid before you leave the station for the summer. While payments to the station can be made by check, MLBS cannot provide check cashing services.

To Bring With You:

You Will Need:

Pillow
Sleeping Bag or Several Warm Blankets
Sheets (top and bottom, twin size)
Towels
Personal Toiletries
Prescription Medication
Laundry Soap
Rugged "Field Clothes" (jeans, shorts, t-shirts)
Sweaters or Sweatshirts
Jacket
Shoes Good for Hiking
Flashlight
Sunscreen
Rain Gear
Water Bottle

Optional But Useful:

Mountain Bike
Bathing Suit
Laptop Computer

You will be housed in "rustic" student cabins; 8 to a cabin, 2 to a room. Each cabin has a single bathroom with shower. Bedrooms have 2 single beds each, 1-2 dressers, a variety of chairs and small tables, desk lamps. Cabins may also have a small refrigerator, couches and side tables. Furniture varies among cabins. The only heat in the cabins is the fireplace. Split firewood is available. June nights can be cold, and early June can be wet. Ample sleeping blankets are recommended (we provide only the bare mattress). A limited supply of extra blankets is available to be checked out. You will be most comfortable during the day if you have a variety of layers to dress in – sweatshirts, sweaters, fleece, good footwear, hats, raingear, etc. Wet weather gear is critical.

Travel

Please let us know when you plan to arrive and leave. It you are driving, please remember that the Station is on top of a remote mountain. The last 7 miles of the drive is steep, curvy, and climbs 2,000ft. The final 2 miles is state-maintained dirt road, but is subject to washouts and serious erosion throughout the summer. If you are flying we recommend Roanoke Regional Airport (ROA). Please give us your flight information as soon as you know it. We can arrange to have you picked up from ROA only.

Responsibilities, Policies and Problems

You are responsible for understanding and abiding by all the material contained in the *MLBS Users Handbook*, as well as the material presented here.

Please consult the REU Coordinator if you have any problems or needs during the program. It is the job of the Coordinator to make sure your project is running smoothly and will be successfully completed, and to be your advocate in any matter affecting your productivity and happiness at the Station. The Coordinator can also help you obtain supplies or equipment necessary for your project (there is a limited allowance for your research needs) and can mediate any misunderstandings that might arise between you and your mentor, coworkers, Station staff, or cabin-mates.

As a facility of the University of Virginia, the Station operates under an Honor Code requiring that students not lie, cheat or steal. You are governed by this code while enrolled in the program. Please contact the Coordinator, or any University of Virginia student, if you have questions about the code, or feel it has been violated. A written copy of the code is available from our web site. All residents at the Station are expected to conduct themselves in a responsible adult manner. The Station Director reserves the right to dismiss any person for inappropriate behavior or whose actions it is judged pose a danger to him/herself or others. Underage drinking and substance abuse are illegal.

If you experience situations at the Station that make you feel uncomfortable or threatened in any way (e.g. physically, sexually, psychologically, etc.), please contact any of the Station staff. Inappropriate or unprofessional behavior of any kind will not be tolerated. The University of Virginia's Office Equal Opportunity Programs is also available to advice and assist with behavioral or discrimination issues. See the Mountain Lake web site (mlbs.org) for complete MLBS and UVA policies, procedures and resources.

III. FOR MENTORS

1) *Time Commitment:* We expect mentors to be in residence at the station for at least 8 weeks during their undergraduate researcher's 10 week stay. The mentor's presence is absolutely essential during the student's first few weeks and last two weeks at the station. You need not feel bound to the station's 10-week summer session schedule if your fieldwork demands that your undergraduate researcher arrive at the station before the beginning of the first summer session. However, you do need to inform the program coordinator of the arrival and departure dates for your student.

2) *Responsibilities:* Mentors should contact their undergraduate researchers in April and provide them with a description of the mentor's research program and a list, or reprints, of relevant readings.

   Mentors, or suitably motivated members of mentors' labs, should be present at the station when their undergraduate researchers arrive. A tour of the station and your field site can provide a nice welcome for the student.

   During the first two weeks of the undergraduate researcher's stay at the station, the mentor should work with the student to develop a research proposal. At this time, the mentor also should establish his/her expectations for, 1) the student's participation in other aspects of the mentor's research program, 2) working hours, 3) authorship of work conducted in collaboration with the student. We expect students to spend at least 50% of their time at the station on tasks directly related to their projects. Ideally, the work the student does for his/her project and other projects in your lab will be complimentary.

   Our experience indicates that mentor's who devote substantial amounts of time to the supervision of their undergraduate researchers during the first few weeks of the program tend to be the most satisfied with these collaborations.

   During the last two weeks of the session, mentors help their undergraduate researchers analyze their data and prepare formal written and oral reports of the research project. Mentors should instruct their undergraduate researchers in appropriate forms of data entry for their projects and are responsible for data analysis and interpretation of results for their students' projects.

   A note to mentors with large labs: If you plan to assign responsibility for your undergraduate researchers to graduate students or post-docs in your lab, please discuss this with these lab members before the undergraduate researchers arrive. Undergraduate researchers should be informed of the arrangement as early as possible. In our experience, students want a mentor to call their own from day one and find multiple mentor situations confusing and uncomfortable unless mentors coordinate their activities well.

The Project

1) *Project Topic:* Mentors should help their undergraduate researchers design projects that have the potential to yield publishable results. The degree of satisfaction among our mentors appeared to be related to how directly their students' projects related to their own research programs. Some projects are very closely related to the mentor's summer activities; some are not. Either way is fine as long as expectations are clear and the student is able to participate in all aspects of the project's design, execution, and interpretation.

2) *Research Proposal:* At the beginning of the third week of the program the undergraduate researchers will provide oral presentations of their research proposals to the entire station. Since some have no experience with such presentations, mentors should require a written draft of the proposal before the oral presentation and should go through at least one practice run of the talk before the formal presentation. The student and the mentor will then use input obtained from other researchers at the station to revise the written proposal, which will then be submitted to the REU Coordinator at the end of that week. Students will be provided with guidelines for the oral presentation and the written proposal during the first week of the program.

3) *Final Report:* During the last week of the program, the student will present a 15 minute oral report on his/her project to the entire station as part of the REU Symposium. The REU Seminar Series will provide students with instruction on the production of slides, but mentors are responsible for the content and delivery of these presentations. Since students will leave the station with a complete presentation, we hope that mentors will encourage the undergraduate researchers to present their results at regional and national professional meetings.

   Each undergraduate researcher will write a formal scientific report (in manuscript format) of the project, that upon your approval, he/she will submit to the REU Coordinator. EACH UNDERGRADUATE RESEARCHER MUST SUBMIT A FINAL WRITTEN REPORT TO THE REU COORDINATOR BEFORE LEAVING THE STATION. The *Final Report* abstracts will be "published" on the MLBS web site.

4) *Funds for Supplies:* The REU grant provides some funds for equipment and expendable supplies used by undergraduate researchers. Requests for supplies and equipment should be directed to the REU Coordinator.

5) *Field and Lab Cleanup:* Please make sure that your student's lab is clean and that flagging and other paraphernalia from the field are ***completely cleaned up*** before leaving the station for the summer.

6) Follow-up: Please inform the Station Director or the REU Coordinator of any publications or presentations at professional meetings that you co-author with your undergraduate researcher.

7) Acknowledgement: The NSF requires that any publication resulting from, or including, work supported by the MLBS REU-Sites program include the following acknowledgement: *"This material is based upon work supported by the National Science Foundation under Grant No. 0453380."* [or current grant number, see REU web page for updates.]

Problems

If you encounter problems with your undergraduate researcher, or have any problems with the program, please contact the REU Coordinator.

Thanks!

Being an REU mentor has both some cost and some great benefits to you. We greatly appreciate your willingness to serve as a mentor. We hope that you find it rewarding as well as scientifically productive. Please talk to the Director or REU Coordinator if you have any problems, criticisms or suggestions.

Please direct questions and correspondence to:

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