

RMBL Independent Research I and II – Syllabus

Summer 2024

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Independent Research I (3 or 5 credits, option for credits through Western Colorado University). June 9-July 11, 2024.
Independent Research II (5 credits, option for credits through Western Colorado University). July 12-Aug 14, 2024.

Course description Students will participate in an independent research project, mentored by a scientist at the Rocky Mountain Biological Laboratory. Independent Research I for 3 credits is similar to independent research I for 5 credits, with the difference being that during the first 5 weeks of the 10-week program the student will also enroll in a 2-credit field course and therefore participate in fewer research activities. Expectations and time commitments for Independent Research II (second 5 weeks of the program) are the same for all students. Independent Research I and II include an orientation to the RMBL scientific community, development of a research proposal, conducting the project, and a final scientific presentation and report. Students also attend weekly workshops and discussions on data analysis and presentation, metadata and archiving, GIS/GPS of study sites, responsible conduct of research, ethics of research, and pathways to STEM careers.

Course objectives

1. Plan and conduct an independent research project under the mentorship of a scientist.
2. Present a research proposal, orally and in writing, and provide a peer-review.
3. Collect and analyze data in an ethical manner.
4. Strengthen skills necessary for a successful career in STEM.
5. Present a final research paper, both orally and in writing.
6. Collect GPS data and create a GIS map of all study sites, spatial metadata.
7. Create non-spatial metadata for archiving of project.

Materials and Equipment. RMBL provides access to a scientific library, natural history collections, computing, and advanced scientific equipment. Students are responsible for appropriate personal items (for example- bedding for cabin-style housing and clothing for outdoor project work in mountain climate conditions).

Course grades: Grades will be based on

Independent Research I:

Participation- 10%

Research & workshop activities- 40%

Written and Oral Research Proposal, Proposal Peer-review- 50%

Independent Research II:

Participation- 10%

Research & workshop activities- 30%

Final research paper, including spatial data- 50%

Final oral presentation and metadata archiving- 10%

Assignments:

Research Proposal & CV

Experimental Design and Statistics workshops

Responsible Conduct of Research and Ethics discussions

GPS training on advanced equipment and GIS maps

Final oral presentation & research paper

Non-spatial and spatial metadata forms and archiving

Schedule:

The program runs in-person (on site at RMBL) for 10 weeks, from June 9-August 14, 2024. Two days of pre-session (virtual format, non-synchronous) activities are required. Students are expected to meet with their research mentor, conduct research, and participate in program activities for 40 hours/week for 10 weeks.

Week 1- Orientation

RMBL Science, facilities, resources

Experimental Design and Statistics

Week 2- Research Methods Introduction to GPS

Responsible Conduct of Research/Ethics

Week 3-Research methods Field research methods, Project proposals, design, statistics

Data management, metadata

Responsible Conduct of Research/Ethics

Week 4-Research Research proposal written and oral presentations

Introduction to GIS and metadata

Responsible Conduct of Research/Ethics

Week 5-Research Research proposal peer-review and revision

Responsible Conduct of Research/Ethics

Week 6- Research Field research

GIS tools and metadata archiving

Responsible Conduct of Research/Ethics

Week 7-Research Field research

Analytical tools and metadata archiving

Responsible Conduct of Research/Ethics

Week 8-Research Field research

Analytical tools, scientific communication

Responsible Conduct of Research/Ethics

Week 9-Research Final research presentations- oral

Final research project paper- written

RCR/Ethics, Careers/Graduate programs in STEM

Week 10-Research Revision of research paper

Completion of field project- clean up

Archiving metadata and final project data/paper

Program completion, checkout forms