

## 01:447:410 Research in Genetics – Writing Intensive

**Description:** Research project in the laboratory of a faculty member and intensive instruction in writing a scientific paper in genetics.

**Credits:** 3 - By Permission Only

**Prerequisites:** The request for this course must be initiated by the Research Advisor. Will only be approved for declared majors in Genetics.

**Learning Goals:** By the end of the course, the student will be able to

- Respond effectively to editorial feedback from supervisors through successive drafts and revisions
- Communicate effectively in modes appropriate to the scientific discipline of the research mentor
- Evaluate and critically assess sources and use the conventions of attribution and citation correctly.
- Analyze and synthesize information and ideas from multiple sources to generate new insights

This course is meant to satisfy some of the writing requirements (WCr and WCd) for the SAS Core Curriculum. It requires a more extensive research paper at the end of the semester than the normal research course (i.e., 01:447:406-407).

### Expectations of the Research Student

To make the experience worthwhile for both the student and the research mentor, we expect the student to commit a sizable amount of time to the Research course. The Research course is not, and should not, be “an easy A” course. On average, the student should expect to spend between 3 to 5 hours a week per credit in the lab during the Fall or Spring semesters. Thus, for a typical three-credit course, students would be expected to work 12-15 hours per week. During this period, the student will be expected to be in the lab conducting experiments, organizing their data, reading about their research project, attending lab functions and meetings, and completing reports and their research paper.

### End of Semester Paper

A written research paper in the format of a scientific paper is required at the end of each semester. The research paper should include an Introduction, Materials and Methods, Results (data should be presented in figure and/or tabular form), Discussion, and References. In general, we require a minimum of 10 pages for a one, two or three credit course (double spaced, no larger than 12 pt. font). When registering for more than three credits, students are expected to write an additional 3 pages per credit above the minimum 10-page paper. Please consider these page guidelines as *rock-bottom* minimums. The student’s report needs to be long enough to get the job done and to satisfy research mentor’s expectations.

This paper must be written over several drafts (minimum of two drafts in addition to the final product) with heavy editorial input from the research mentor. This is in addition to any research being conducted during the semester.

The paper is a major part of the grade and must be written in the student's own words. The student should avoid extensive quotes and paraphrases. Papers that are not original may be rejected (see below). All papers will be checked with TURNITIN.

The student must upload an electronic copy of the paper to the SAKAI (<https://sakai.rutgers.edu/portal/>) site for Research in Genetics – Writing Intensive for that particular semester. Papers may be submitted in either .doc, .pdf, or plain text (.txt) formats. The *Submission Title* for your paper should be the student's name, the course number, and RUID. For example, Gregor Mendel 406 RUID 301001121. Do not use titles such as "Research Report." We will download the final paper from the email for our archives, and we need each paper to be easily identifiable.

*The research paper is due for SAKAI upload by the first day of final exams by 11:30 AM. If a grade is not received by this time, the student will receive a grade of NG on their transcript. It is the responsibility of the student to know the due date.*

### **Grading**

The research mentor must complete an assessment rubric as per the requirements of the SAS Core (see below). The Vice Chair also reviews the paper and the assessment rubric at the end of the semester to determine whether or not the student has met the requirements.

The final research paper will be assessed for (1) content and (2) quality of writing, with an evaluation of the following parameters:

- Content
  - Scientific accuracy
  - Comprehensiveness
  - Appropriate use of technical language
  - Appropriate use of citations
- Writing
  - Overall structure
  - Paragraph structure
  - Sentence structure
  - Grammar and spelling
  - Use and format of tables and figures
  - Format of references

The quality of content and writing should be consistent with that found in the scientific discipline.

For each rubric/question, the research mentor should select the appropriate evaluation. When completed, the research mentor should send a copy of this grading rubric form to the Vice Chair ([heiman@dls.rutgers.edu](mailto:heiman@dls.rutgers.edu)) by the first day of exams.

**1. How would you rate the student's ability to respond effectively to editorial feedback from supervisors through successive drafts and revisions.**

*Outstanding:*

- Demonstrates effective incorporation of constructive criticism from peers and instructors in successive drafts and evidences self-editing and revision without prompting.
- Improvement evident in successive drafts resulting in an outstanding final work.

*Good:*

- Demonstrates effective incorporation of constructive criticism from peers and instructors in successive drafts.
- Improvement evident in successive drafts resulting in a good final work.

*Satisfactory:*

- Satisfactorily responds to constructive criticism from peers and instructors in successive drafts.
- Improvement evident in successive drafts resulting in a satisfactory final work.

*Unsatisfactory:*

- Does not incorporate feedback, or does not submit revised work.
- Final work is unsatisfactory

**2. How would you rate the student's ability to communicate effectively in modes appropriate to the scientific discipline of the research mentor.**

*Outstanding:*

- Addresses topic at an advanced, professional level; communication is well-argued, effectively presented, and free of word-choice, grammar, spelling or organizational errors.
- Accurately and effectively employs relevant discipline-specific format and terminology.
- Jargon and complex terms and concepts are well-defined and appropriate to the targeted audience.

*Good:*

- Addresses topic soundly and effectively; communication is well- argued and largely free from word- choice, grammar, spelling or organizational errors.
- Employs relevant discipline-specific format and terminology.
- Terms and concepts are generally defined and appropriate to the target audience.

*Satisfactory:*

- Addresses topic and satisfactorily adheres to the format prescribed by the course.
- Communication presents a coherent narrative, exposition, or argument.
- Uses discipline-specific format and terminology with an awareness of the intended audience.

*Unsatisfactory:*

- Does not address topic, or does so in a way that is uninformative, inaccurate, and/or misleading.
- Communication is confusing and contains numerous errors.
- Fails to use appropriate discipline- specific format and terminology; fails to communicate effectively to the intended audience.

**3. How would you rate the student's ability to evaluate and critically assess sources and use the conventions of attribution and citation correctly.**

*Outstanding:*

- Demonstrates a sophisticated ability to access appropriate sources/data and critically assess their authority, reliability, credibility, and possible bias and the credentials of the authors(s) and publisher(s) – electronic or otherwise.
- Cites a comprehensive range of relevant and appropriate sources, and accurately applies appropriate conventions for attribution and citation.

*Good:*

- Demonstrates strong ability to access appropriate sources/data and critically assess their authority, reliability, credibility, and possible bias and the credentials of the authors(s) and publisher(s) – electronic or otherwise.
- Cites relevant sources. Applies appropriate conventions for attribution and citation.

*Satisfactory:*

- Demonstrates satisfactory ability to access appropriate sources/data and critically assess their authority, reliability, credibility, and possible bias and the credentials of the authors(s) and publisher(s) – electronic or otherwise.
- Satisfactorily cites sources using appropriate conventions for attribution and citation.

*Unsatisfactory:*

- Demonstrates little ability to access appropriate sources/data and critically assess their authority, reliability, credibility, and possible bias and the credentials of the authors(s) and publisher(s) – electronic or otherwise.
- Fails to cite sources and apply appropriate conventions for citation and attribution.

**4. How would you rate the student's ability to analyze and synthesize information and ideas from multiple sources to generate new insights.**

*Outstanding:*

- Provides sophisticated evaluation and critical assessment of evidence/data, arguments, and counter- arguments drawn from multiple sources.
- Artfully uses this analysis in advancing thesis or for placing hypothesis testing in appropriate context.
- Insightfully explores larger implications and connections; demonstrates original thinking; explicates limits of findings.

*Good:*

- Provides strong evaluation and critical assessment of evidence/data, arguments, and counter-arguments drawn from multiple sources.
- Successfully uses this analysis in advancing thesis or for placing hypothesis testing in appropriate context.

- Explores larger implications and connections; demonstrates critical thinking; identifies limits of findings.

*Satisfactory:*

- Provides satisfactory evaluation and assessment of evidence/data, arguments, and counter-arguments drawn from multiple sources.
- Satisfactorily incorporates this material.
- Notes implications, connections, and limits of findings.

*Unsatisfactory:*

- Fails to provide evaluation and assessment of evidence/data, arguments, and counter-arguments drawn from multiple sources.
- Little or no attention to implications, connections, and limits of findings.

**5. What letter grade do you wish to assign to the student? \***

- A** The student has surpassed the expectations of the course and demonstrated “outstanding” achievement evaluations in most or all rubrics.
- B+** The student has surpassed the expectations of the course and demonstrated a combination of “outstanding” and “good” achievement evaluations in the rubrics.
- B** The student has achieved the learning goals of the course and demonstrated “good” achievement evaluations in most or all rubrics.
- C+** The student has achieved the learning goals of the course and demonstrated a combination of “good” and “satisfactory” achievement evaluations in the rubrics.
- C** The student has achieved some but not all of the learning goals of the course and demonstrated “satisfactory” achievement evaluations in most or all rubrics.
- D** The student barely achieved any of the learning goals of the course and demonstrated a combination of “satisfactory” and “unsatisfactory” achievement evaluations in the rubrics.
- F** The student did not achieve any of the learning goals and demonstrated “unsatisfactory” achievement evaluations in most or all rubrics.

*\*Note: if this is the student's first semester in your lab or group, then please calibrate your expectations accordingly. A brand new student in your lab or group might not achieve “outstanding” in all of the rubrics above, but still be doing “A” grade work when calibrated for his or her inexperience.*