

2/25/2013: Revised 1-Core

FORMAT 7

Submit originals and one copy and electronic copy to Governance/ Faculty Senate Office  
(email electronic copy to [fysenat@uaf.edu](mailto:fysenat@uaf.edu))

***REQUEST FOR CORE WRITING INTENSIVE DESIGNATOR***

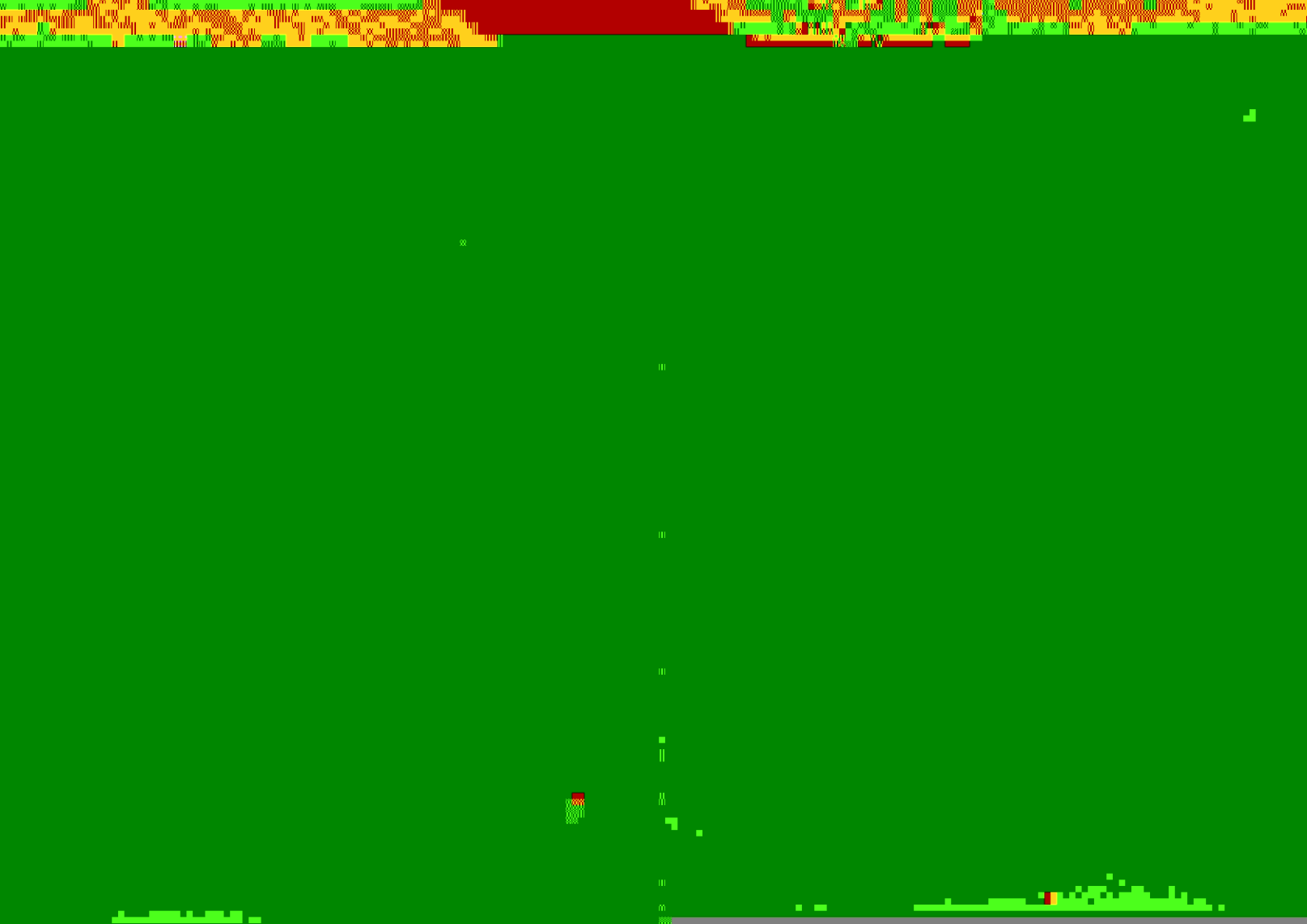
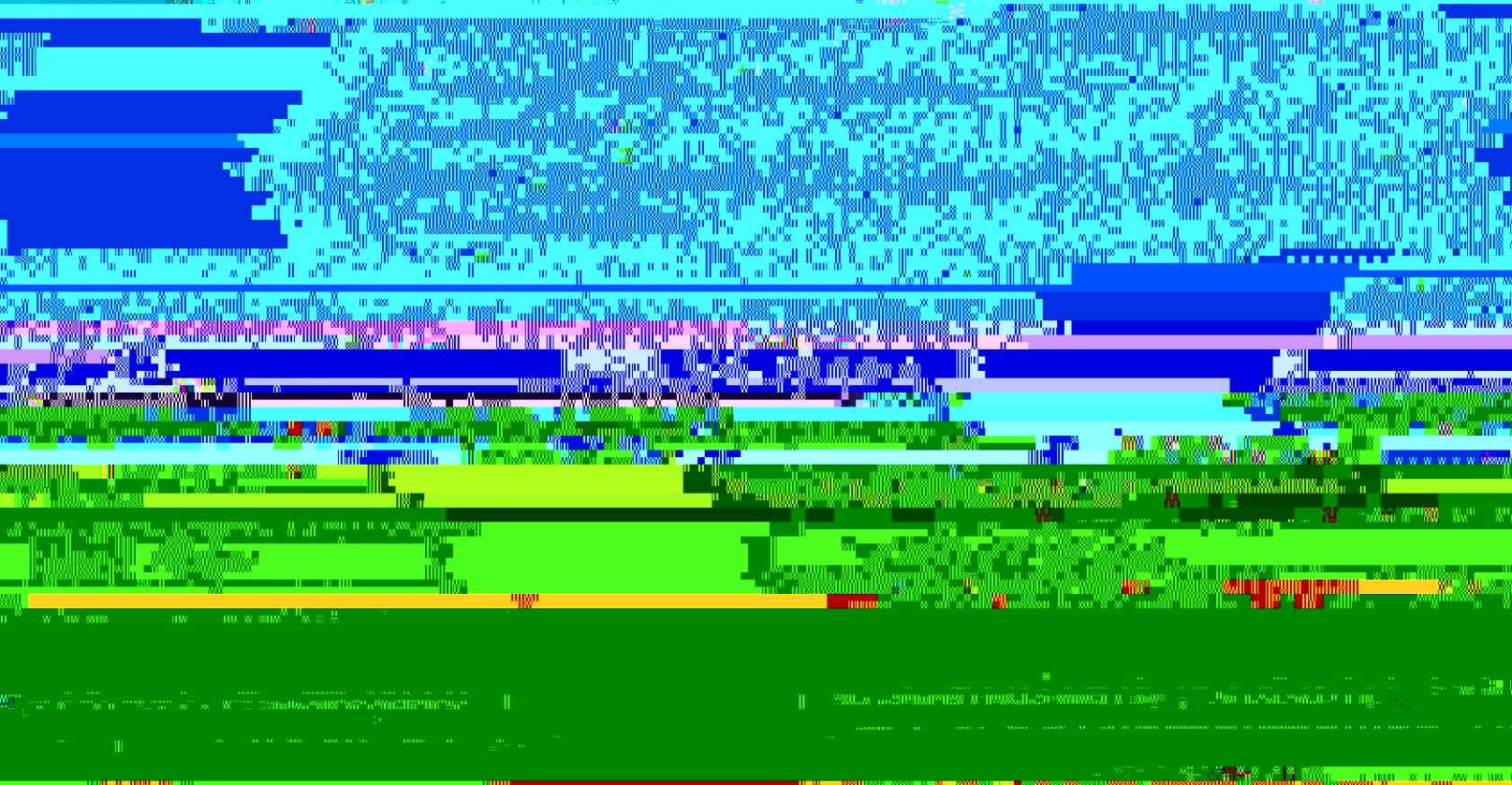
***SUBMITTED BY:***

The new standard must also reflect the following basic elements:

ADDITIONAL INFORMATION

117

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**Undergraduate Research in Metabolism and Biochemistry**  
**UAF BIOL 403 (4); CRN XXXXX**  
**Course Syllabus**

Studies of the cells and genes of the nematode *Caenorhabditis elegans* have become a cornerstone of current biology. Using this simple and malleable animal model, students will conduct their own biological investigations and, through this research learning, will gain an understanding of intermediary metabolism. Topics include major pathways of carbon, nitrogen, and lipid metabolism,



**principles of metabolism and biochemistry, and it will give students an opportunity to investigate metabolism in a simple and genetically tractable animal model, the nematode *Caenorhabditis elegans*.**

Biochemistry is the chemistry of living things. All living things have in common that they are adapted to survive, grow, and reproduce. To do this they must produce a variety of biomolecules using resources they acquire from their environment. In this course we will strive for an understanding of how living organisms convert resources they acquire from their environment into more of themselves.

**Course Organization:** The course will lead the student in a consideration of the foundations of metabolism and biochemistry, which integrate with the distinguishing features of living organisms. Living organisms have in common six distinguishing features

1. their chemical complexity and microscopic organization;
2. their systems for extracting and transforming energy;
3. the defined functions of their components and the regulated interactions among their components;
4. their mechanisms for sensing and responding to the environment;
5. their capacity for self-replication and self-assembly;
6. their capacity to change over time.

These common features will be explored through the cellular, physical, chemical, genetic and evolutionary foundations of metabolism and biochemistry as they occur in our model organism, *C elegans*. There are **3 central concepts** each divided into topics (readings will be posted on Blackboard). We will spend up to one class period on each topic. The first three weeks in lectures and laboratories, however, will introduce student to the basic biology and culture techniques for *C elegans* and by the third week of the semester students will have identified a research project and begun culturing worms for that project. Questions and discussion throughout the course lecture and laboratory periods are encouraged and this

outcome and assigns a final

practicum and supervised research times they schedule themselves. Students are expected to schedule about 6 hours per week to work on their research project. Students are to record these times and the activities performed in a designated research notebook and have their efforts witnessed by a research supervisor. Students cannot work in the laboratory unsupervised. A list of supervisors (the instructor, TA and perhaps other appropriately trained individuals) and their scheduled presence in the laboratory will be posted at the beginning of the semester and updated weekly. The list will also include contact information for each supervisor so that students can make arrangements for additional time in the laboratory if necessary. During the scheduled laboratory periods for the last 10 weeks of the semester, in addition to performing specific assays on the worms (biochemical and metabolic or other physiological assays as listed in the Table of Laboratory Activities and Course Assignments), and thereby acquiring data for their projects, students will be graded on assignments/activities designed to aid students in conducting and completing their research projects. These assignments are listed in the Table of Laboratory Activities and Course Assignments.

resources might be made available to the students' to ensure success in scientific writing. The rubric that the instructors





### **9. Disabilities Services**

At UAF, the Office of Disability Services implements the Americans with Disabilities Act (ADA), and insures that UAF students have equal access to the campus and course materials. We will work with the Office of Disabilities Services

Disease models and drug discovery - Andres V. Maricq  
and Steven McIntire, eds. WormBook pdf  
*C. elegans* and volatile anesthetics - P.G. Morgan, E.-B.  
Kayser and M.M. Sedensky WormBook pdf  
Anthelmintic drugs



**Rubric for Undergraduate Research in Metabolism and Biochemistry Capstone Project**

Final Evaluation of Capstone Project by Course Instructors (=Research Supervisor)

*To be completed by Research Supervisor*

	Yes (excellent)	Somewhat (adequate)	No (inadequate)