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Metabolism and Biochemistry
4 Credits Offered Fall

Caenorhabditis elegans

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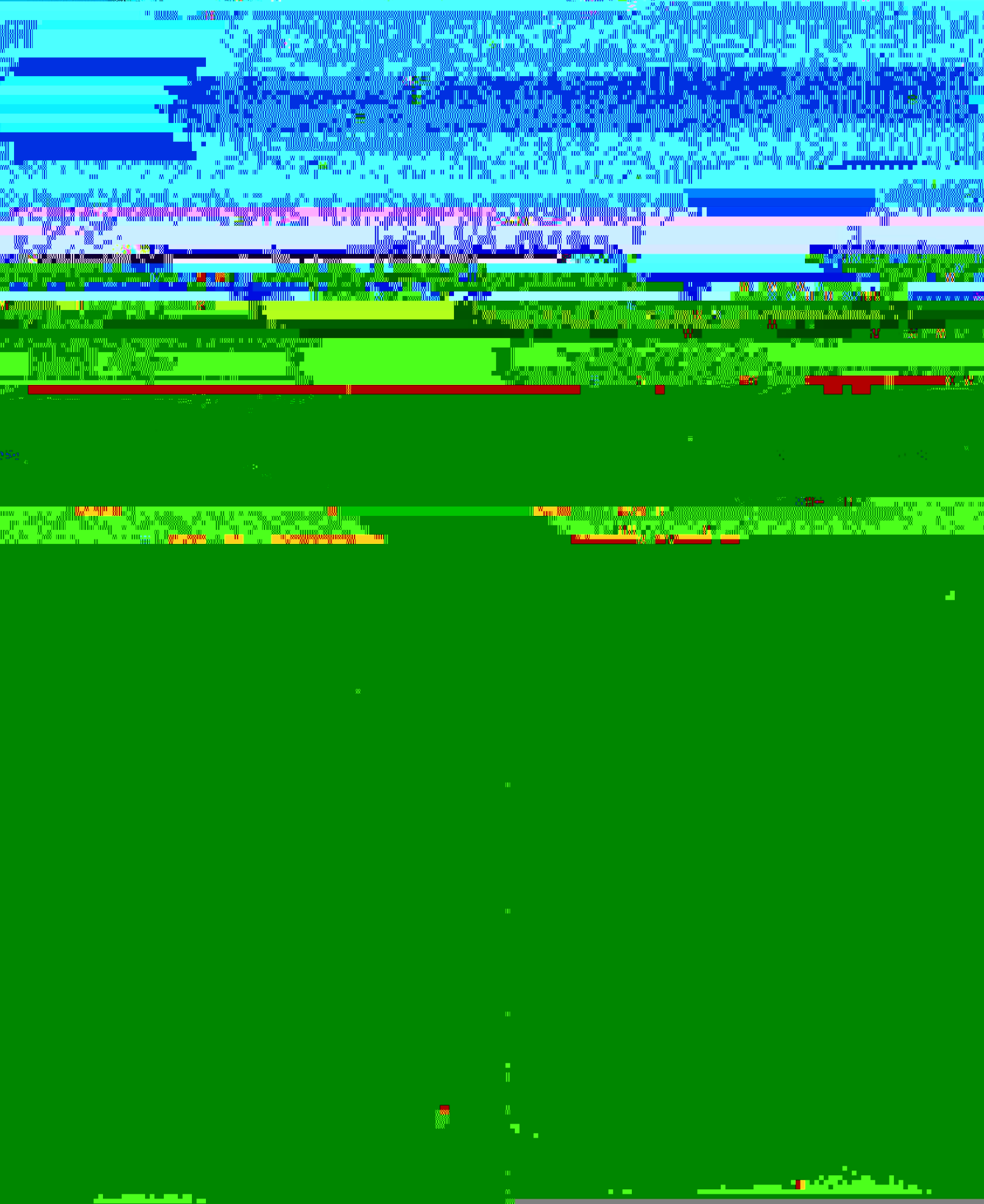
regulation and signaling, and longevity and aging.

Prerequisite: GOM 5111Y or GOM 5111

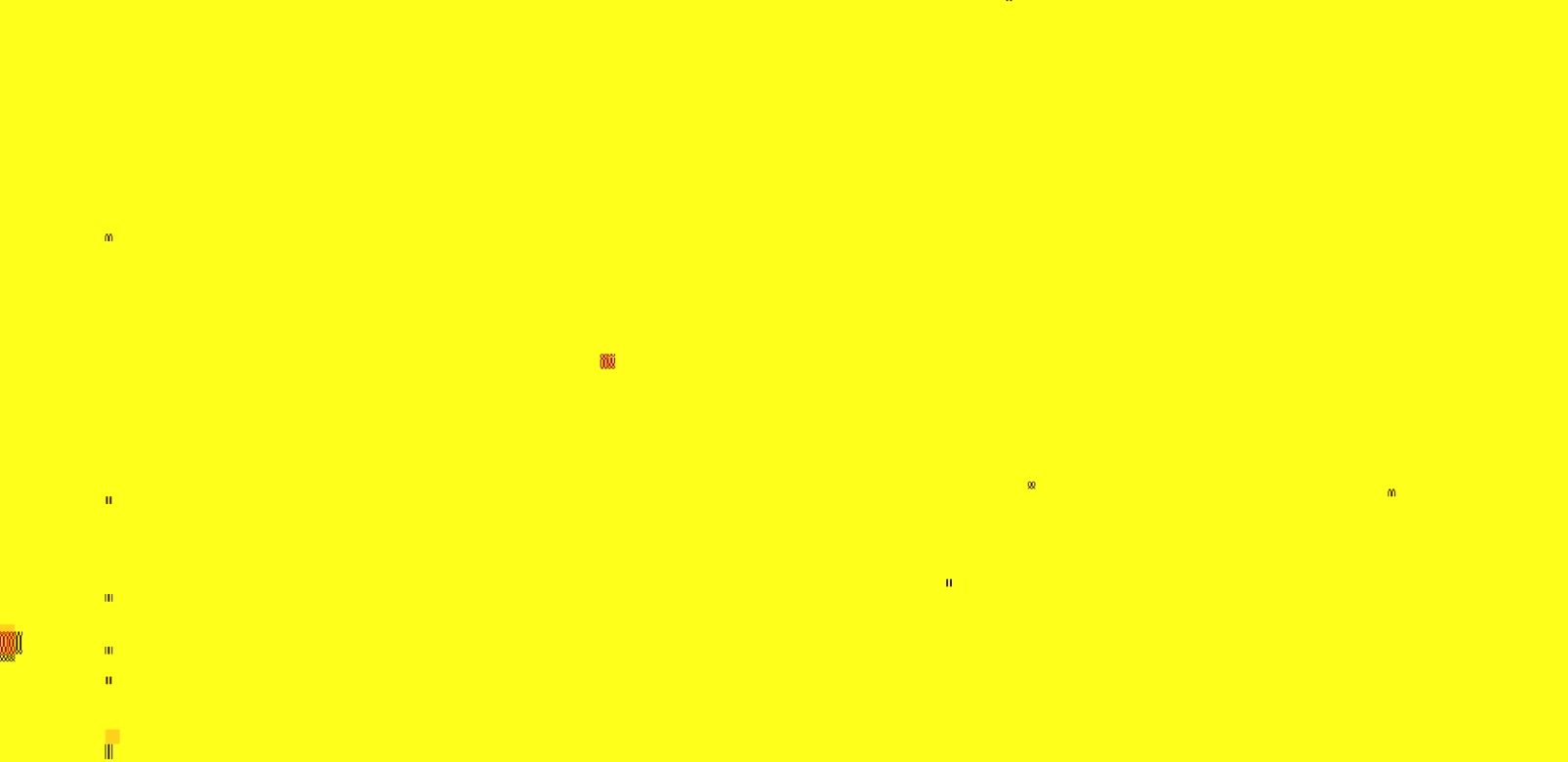
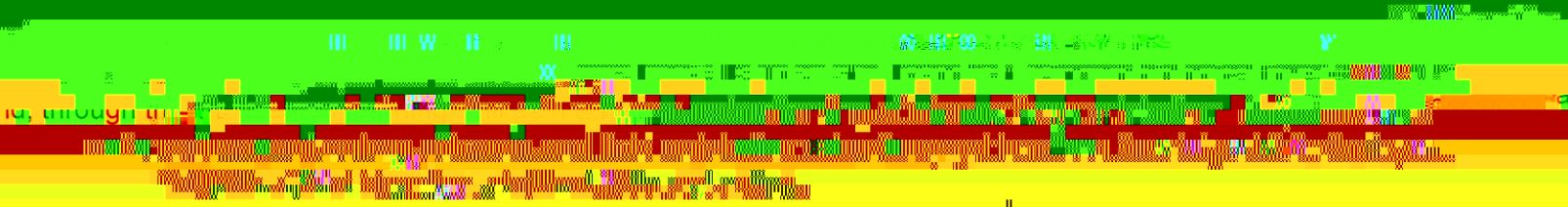
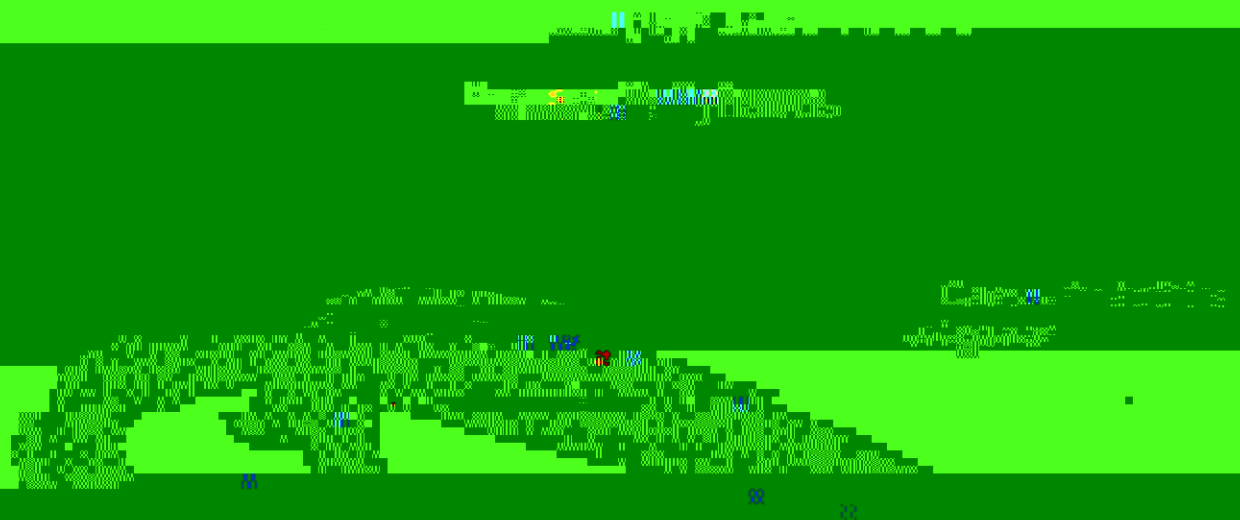
Y, ENGL 5111Y, VCL 5111Y or ENGL 5111

or permission of instructor. (10473)

Note to Registrar:



Metabolic Pathways



1. Course Information:

Metabolism and Biochemistry, BIOL 4XX (4)

Meeting Times: Tues 9:45 – 11:15 am, Life Sciences

Wed 2:15 – 5:00 pm

Prerequisites: BIOL 3XX, CHEM 105, 109, 100A.

2. Instructing Staff:

Dr. [Name], Ph.D., Associate Professor of Biology (Neurophysiology)

Office: Arctic Health Research Building, Room 0413

Phone: [Number]

Email: [Address]

Website: [Address]

Lab: [Address]

Teaching Assistant: [Name]

Phone: [Number]

Email: [Address]

Website: [Address]

Lab: [Address]

Office: [Address]

Phone: [Number]

Email: [Address]

Website: [Address]

Lab: [Address]

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The goal of this course is to provide an understanding of the role of the...

Alkylation

Alkylation is a chemical reaction in which an alkyl group is introduced into a molecule. This process is fundamental in organic synthesis, particularly in the production of various pharmaceuticals and polymers. The reaction typically involves the reaction of an alkyl halide with a nucleophile.

The mechanism of alkylation involves the formation of a nucleophile, which then attacks the electrophilic carbon of an alkyl halide. This results in the displacement of the halide ion and the formation of a new C-C bond. The reaction is often carried out in an aprotic solvent to facilitate the nucleophilic attack.

Alkylation is a key step in the synthesis of many complex molecules, including drugs and materials. The choice of reagents and conditions can significantly impact the yield and selectivity of the reaction. Understanding the underlying mechanisms is crucial for the design and optimization of these reactions.

In addition to its role in synthesis, alkylation is also important in the study of reaction kinetics and mechanisms. The study of alkylation reactions provides valuable insights into the behavior of nucleophiles and electrophiles in different reaction environments.

The reaction is often studied using various analytical techniques, such as infrared spectroscopy and nuclear magnetic resonance (NMR). These techniques allow for the identification and characterization of the products and intermediates formed during the reaction.

Alkylation reactions are also used in the synthesis of polymers and other materials. The controlled introduction of alkyl groups into a polymer backbone can significantly alter its properties, such as its solubility and mechanical strength.

In conclusion, alkylation is a fundamental reaction in organic chemistry with a wide range of applications. A deep understanding of its mechanisms and kinetics is essential for the successful design and execution of these reactions in both laboratory and industrial settings.

The study of alkylation reactions continues to be an active area of research, with new methods and reagents being developed to improve the efficiency and selectivity of these reactions.

Blackboard Page Several learning resources will be available on the course Blackboard Page:

a. Answers of the lecture slides will be posted just prior to class

- b. A manual for *C elegans* culture in the UAF laboratory will be posted.
- c. Answers to the exam questions will be posted on Blackboard after the exams have been completed and graded.
- d. The course Blackboard Page will contain links to other instructional and informative pages on biochemistry. Some of these will include practice quizzes and short movie clips, which are especially good learning aids.

A copy of this syllabus and the course calendar will be posted separately on Blackboard

guidelines for acceptable and unacceptable behavior.

Honesty is a primary responsibility of you and every other UAF student. The following are common guidelines regarding academic integrity:

1. Students will not collaborate on any quizzes or exams that will contribute to their grade in a course, unless permission is granted by the instructor of the course. Only those materials permitted by the instructor may be used to assist in quizzes and exams.
2. Students will not represent the work of others as their own. A student will attribute the source of information not original with himself or herself (direct quotes or paraphrases) in compositions, theses and other reports.
3. No work submitted for one course may be submitted for credit in another course without the explicit approval of both instructors.

Alleged violations of the Code of Conduct will be reviewed in accordance with procedures specified in regent's policy, university regulations and UAF rules and procedures. For additional information and details about the Student Code of Conduct, contact the Dean of Student Services at www.alaska.edu/hof/ or refer to the student handbook that is



10. Course Calendar (subject to change)

Principles of Metabolism and Biochemistry

Biology 303 Fall 2012

Section I. *C elegans* a model for biological research

1. Sept. 5 Class introduction
2. Sept. 12 *C elegans* biology
3. Sept. 19 Trends in *C elegans* research

Ecology of *Caenorhabditis* species, Kiontke et al 14pp

Intermediary metabolism, Braeckman et al 24pp

Three recent reviews will be selected and pdfs posted on Blackboard

Section II. Metabolism and Biochemistry

Capstone Project in Biological Sciences

The intent of the Biological Sciences capstone project is to integrate a range of knowledge and skills learned in previous courses, including scientific knowledge, quantitative literacy, and communication skills, and to apply these products of the university education to a creative activity. For a biologist, a fundamental expression of applied knowledge, creativity, and

critical reasoning is to engage in scientific inquiry.

Rubric for Undergraduate Research in Metabolism and Biochemistry Capstone Project

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

To be completed by student

Student's name _____ Date _____

Capstone Project Title _____

Research Supervisor _____

To be completed by Research Supervisor

	Yes (excellent)	Somewhat (adequate)	No (inadequate)
1. Does the capstone paper represent the student's own scientific research?			
2. Does the capstone paper make a compelling argument for the significance of the student's research within the context of the current literature?			
3. Does the capstone paper clearly articulate the student's research goals?			
4. Are the methods appropriate given the student's research agenda?			
5. Is the data analysis appropriate and accurate?			
6. Does the thesis skillfully interpret the results?			