

URSC 101

Decoding Science: Mastering Primary Literature Analysis

1 Credit

Community College of Baltimore County
Common Course Outline

Description

URSC 101 – Decoding Science: Mastering Primary Literature Analysis: this course is designed to introduce students to primary literature analysis in the context of scientific research. Students will explore aspects of experimental design and the variety of ways that scientists communicate their findings in primary literature. They will also examine the need for ethical behavior in scientific research. Formerly offered as ARSC 107, earn credit for one only.

Co-requisites: MATH 082

Overall Course Objectives

Upon completion of this course, students will be able to:

1. Characterize the components of a scientific paper, including the abstract, introductions, methods, results, and discussion;
2. Employ skills used for scientific reading, including skimming, scanning, and in-depth analysis;
3. Identify key elements of experiment research design, including hypothesis, variables, controls, and statistical methods;
4. Analyze different methods that are used to present data in scientific papers;
5. Interpret scientific figures, assessing accuracy, limitations, and the strength of the evidence shown;
6. Assess the validity and reliability of published scientific papers;
7. Identify potential sources of bias and question assumptions by proposing alternative interpretations;
8. Demonstrate the importance of ethical behavior in scientific research;
9. Synthesize information from multiple sources to generate a comprehensive understanding of a broader research topic;
10. Conduct an experiment that answers a research question; and
11. Present a contemporary scientific paper in a clear, accurate, and audience-appropriate format.

Major Topics

- I. Scientific Papers
 - a. Common components found in scientific papers
 - b. Reading strategies for scientific papers

The Common Course Outline (CCO) determines the essential nature of each course.
For more information, see your professor's syllabus.

- c. Assessing the quality and validity of a paper
- II. Experimental Design
 - a. Common elements in experiments
 - b. Applying these elements to a self-designed experiment
- III. Scientific Figures
 - a. Common elements in figure design
 - b. Interpreting figures
- IV. Bias
- V. Ethics in the scientific community
 - a. Impacts on experimental design
 - b. Impacts on how experiments are reported
 - c. Impacts on how scientists behave

Course Requirements

Grading will be determined by the individual faculty member, but shall include the following, at minimum:

- Class based discussions
- Designing a functional experiment
- Presentation of a contemporary scientific paper

Written assignments and research projects: Students are required to use appropriate academic resources in their research and cite sources according to the style selected by their professor.

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