

BIO 220A: FOUNDATIONS IN SCIENTIFIC INQUIRY

In Workflow

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Approval Path

1. Mon, 12 Sep 2022 15:11:54 GMT
Jamie Kneitel (kneitel): Approved for BIO Committee Chair
2. Mon, 12 Sep 2022 15:17:58 GMT
Jamie Kneitel (kneitel): Approved for BIO Chair
3. Thu, 22 Sep 2022 03:05:13 GMT
Mikkel Jensen (mikkel.jensen): Approved for NSM College Committee Chair
4. Fri, 23 Sep 2022 00:06:18 GMT
Shannon Datwyler (datwyler): Approved for NSM Dean

New Course Proposal

Date Submitted: Tue, 06 Sep 2022 19:50:08 GMT

Viewing: BIO 220A : Foundations in Scientific Inquiry

Last edit: Thu, 22 Sep 2022 03:05:00 GMT

Changes proposed by: Jim Baxter (102010257)

Contact(s):

Name (First Last)	Email	Phone 999-999-9999
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Catalog Title:

Foundations in Scientific Inquiry

Class Schedule Title:

Foundations in Sci Inquiry

Academic Group: (College)

NSM - Natural Sciences & Mathematics

Academic Organization: (Department)

Biological Sciences

Will this course be offered through the College of Continuing Education (CCE)?

No

Catalog Year Effective:

Fall 2023 (2023/2024 Catalog)

Subject Area: (prefix)

BIO - Biological Sciences

Catalog Number: (course number)

220A

Course ID: (For administrative use only.)

TBD

Units:

3

Is the primary purpose of this change to update the term typically offered or the enforcement of prerequisites at registration?

No

In what term(s) will this course typically be offered?

Fall term only

Does this course require a room for its final exam?

Yes, final exam requires a room

This course complies with the credit hour policy:

Yes

Justification for course proposal:

In its current form, BIO 220 covers a range of topics including scientific inquiry, experimental design, and various written and oral scientific presentation skills. This course is intended to help students develop the core scientific skills they need to progress their thesis/project while also fulfilling the Graduate Writing Intensive (GWI) requirement. However, faculty who have taught the course believe that there is too much material to cover effectively, and not enough time to cover it and still meet GWI requirements. Indeed, little time is available to teach how to write more effectively and the workload is excessive for both faculty and students. Student feedback mirrors this assessment; students often comment that the workload for this class is far too high, yet recognize its value to furthering their degrees.

We plan to address these challenges by dividing the course into two sequenced courses, BIO 220A and 220B, which students take in their first year in the program. BIO 220A will focus on foundational scientific skills and will be updated to reflect the changing discipline of the biological sciences; BIO 220B (GWI) will focus on training students to become better scientific writers through a scaffolded series of writing assignments that culminate in a written draft of their thesis or project proposal, which is required for their advancement to candidacy meeting.

BIO 220A is taken by all graduate students in their first fall semester. The course develops the same set of core foundational scientific skills for all students, regardless of their specialization or degree objective (MS or MA). Like the original BIO 220 course, students will learn how to apply the scientific method, identify a research questions or topics, use scientific databases, evaluate/critique literature, develop an effective experimental design, and conduct simple statistical analyses. However, BIO 220A will expand on the original BIO 220 to include activities on project management/organization, quality assurance and data management, creating an effective research poster, leading discussions/being a good collaborator, developing effective figures, tables, and data sheets, and ethical issues in biological sciences.

BIO 220B is taken by all graduate students in their first spring semester. As a GWI course, BIO 220B focuses on scientific writing. Specifically, the course applies the core scientific and research skills learned in BIO 220A to development of a written proposal of the students' thesis or project.

Course Description: (Not to exceed 80 words and language should conform to catalog copy.)

Introduces the foundations of scientific inquiry at the graduate level. Students learn how to apply the scientific method, obtain and critically evaluate the scientific literature, design experiments, interpret and present scientific data, and initiate their thesis research or project. Lecture three hours.

Are one or more field trips required with this course?

No

Fee Course?

No

Is this course designated as Service Learning?

No

Is this course designated as Curricular Community Engaged Learning?

No

Does this course require safety training?

No

Does this course require personal protective equipment (PPE)?

No

Does this course have prerequisites?

No

Does this course have corequisites?

No

Graded:

Letter

Approval required for enrollment?

No Approval Required

Course Component(s) and Classification(s):

Seminar

Seminar Classification

CS#05 - Seminar (K-factor=1 WTU per unit)

Seminar Units

3

Is this a paired course?

No

Is this course crosslisted?

No

Can this course be repeated for credit?

No

Can the course be taken for credit more than once during the same term?

No

Description of the Expected Learning Outcomes and Assessment Strategies:

List the Expected Learning Outcomes and their accompanying Assessment Strategies (e.g., portfolios, examinations, performances, pre-and post-tests, conferences with students, student papers). Click the plus sign to add a new row.

	Expected Learning Outcome	Assessment Strategies
1	Identify the major professional conventions, research practices, and methods of inquiry in the biological sciences, and the qualities of a successful scientist	On being a grad student & scientist; Article assessment and presentation; Annotated bibliography; Experimental design critiques; Project proposal; Data analysis problem set; Final project presentation & poster
2	Find, evaluate, and critique relevant scientific literature	Article assessment and presentation; Annotated bibliography; Experimental design critiques; Project proposal; Final project presentation & poster
3	Create a novel and well-formulated research question or hypothesis	Project question & hypothesis
4	Identify and critique experimental design approaches to hypothesis testing	Article assessment and presentation; Experimental design critiques
5	Identify appropriate statistical approaches to scientific data	Article assessment and presentation; Data analysis problem set; Graphing assignment
6	Practice communicating scientific topics and reporting results in written and oral form	Article assessment and presentation; Annotated bibliography; Project proposal; Graphing assignment; Final project presentation & poster

Attach a list of the required/recommended course readings and activities:

BIO 220A_Syllabus.docx

For whom is this course being developed?

Majors in the Dept

Is this course required in a degree program (major, minor, graduate degree, certificate?)

Yes

Has a corresponding Program Change been submitted to Workflow?

Yes

Identify the program(s) in which this course is required:

Programs:

MS in Biological Sciences

MA in Biological Sciences

Does the proposed change or addition cause a significant increase in the use of College or University resources (lab room, computer)?

No

Will there be any departments affected by this proposed course?

No

I/we as the author(s) of this course proposal agree to provide a new or updated accessibility checklist to the Dean's office prior to the semester when this course is taught utilizing the changes proposed here.

I/we agree

University Learning Goals

Graduate (Masters) Learning Goals:

Critical thinking/analysis

Communication

Information literacy

Intercultural/Global perspectives

Professionalism

Is this course required as part of a teaching credential program, a single subject, or multiple subject waiver program (e.g., Liberal Studies, Biology) or other school personnel preparation program (e.g., School of Nursing)?

No

Is this a Graduate Writing Intensive (GWI) course?

No

Key: 14745