General Studies Gold Request Form

Consult the General Studies Request FAQ for more information and quick answers.

New permanent numbered courses must be submitted to the workflow in Kuali CM before a General Studies request is submitted here. The General Studies Council will not review requests ahead of a new course proposal being sent to the Senate.

Submission Information

College/School	Department/School
College of Integrative Sciences and Arts (CLS)	School of Applied Sciences and Arts (CASA)

Submission Type

Mandatory Review

New Request: A request for a new designation, a change in designation, or to reinstate a designation that has been lost.

Mandatory Review: Only select if this course (or topic on a *permanent* course) is undergoing mandatory review in the current academic year. Not for omnibus topic use.

Modification: A request to modify the expected learning outcomes of the course, but not change any other aspect of the originally approved proposal. Only for courses that have a previously approved General Studies Gold request.

ASU Request

Is this request for a permanent course or a topic?

Permanent Course

Subject Code	Course Number	Units/Credit Hours
ABS	350	3

Course Information

Enter the course catalog information, found in the web course catalog or Kuali CM.

Course Title

Applied Statistics

Course Catalog Description

Statistical methods with applications in the biological sciences and natural resource management. Uses computers and the Internet.

Enrollment Requirements (Prerequisites, Corequisites, and/or Antirequisites)

Prerequisite(s): General Studies Gold MATH or General Studies Maroon MA course with C or better OR Visiting University Student

Is this a crosslisted course?

No

Is this course offered by (shared with) another academic unit?

No

If you are requesting to change the existing GS Gold (not Maroon) designation, please check this box.

General Studies Gold Designation Request

General Studies Designation

Quantitative Reasoning (QTRS)

Attach a representative syllabus for the course, including course learning outcomes and descriptions of assignments and assessments.

ABS 350 Applied Statistics - GS QTRS Syllabus.docx

Quantitative Reasoning (QTRS)
Quantitative and computational reasoning is essential for success in 21st-century careers, for critically evaluating information in the age of "big data," for assessing the quality of arguments conveyed through digital media, for informed participation in community and social life, and for contributing to the formulation of effective solutions for achieving a sustainable and just future. Quantitative reasoning enables students to apply relevant mathematical, statistical, computational, and visualization methods in academic, social and personal settings.

In a quantitative reasoning course, students learn about data, data management, data summaries, data visualization, and the use of computational tools with data. Data can take many forms, including numerical data, textual data, images, and others. Students also learn about how quantitative reasoning can be used to make arguments clear, precise and verifiable. Finally, they learn to build quantitative models, make predictions, and communicate their findings based on available data. This may include some combination of mathematical, statistical, computational or network models, or visualizations.

Most of the course content should align with the Gold category learning outcomes.

Instructions: In the fields below, state the assignment, project, or assessment that will measure each learning outcome, and provide a description. The description should provide enough detail to show how it measures the learning outcome. If needed, more than one can be identified.

The proposal does not need to include all course assessments that measure a given learning outcome. The provided assessment should include sufficient detail to allow the subcommittee to make their evaluation. When appropriate, the same assessment can be listed for more than one learning outcome (e.g., a culminating project).

You may provide links to a document (Google Drive or Dropbox) that includes the relevant details for the assessment. **Do not provide links to Canvas shells.**

QTRS Learning Outcome 1: Understand variables, measurement and data, including how they can be used to pose and answer questions about society and nature, and to manipulate, organize, classify and visualize quantitative data.

Assignment #1 - Introduction to R

Description: Students use R to perform basic mathematical calculations (e.g., square roots and logarithms), estimate biological parameters (e.g., a tree's basal area), and estimate the volume of a sphere. Then, students will work with a real dataset on the biometry of Achatina fulica (Gastropoda: Pulmonata), an invasive snail found in many parts of the globe. In this activity, students will learn to use R and basic functions to estimate key biological parameters, thereby understanding important aspects of their population dynamics, such as age structure.

Evaluation criteria: Students are evaluated based on correct responses, as the questions are objective and specific, with precise numerical answers expected.

Feedback: The assignment will be published in Canvas. The deadline for submitting an assignment is 1 week after the Canvas due date. Assignment notes will be made available to students a week after the deadline.

See end of syllabus for Assignment details. (p.9)

QTRS Learning Outcome 2: Evaluate arguments from everyday life or academic fields of study that are represented mathematically, statistically, computationally, or in visualizations.

Assignment #2 – Basic Statistics with R

Description: Students use R to perform basic epidemiological calculations (e.g., Number of outpatient visits for influenza-like illness, Total patients seen for any reason, Percentage of patients due to influenza-like illness). In this activity, students will learn how to import a dataset directly from an online source and how to handle incomplete data.

Evaluation criteria: Students are evaluated based on correct responses, as the questions are objective and specific, with precise numerical answers expected.

Feedback: The assignment is published in Canvas. The deadline for submitting an assignment is one week after the due date in Canvas. Assignment notes will be made available to students a week after the deadline.

See end of syllabus for Assignment details. (p.9)

QTRS Learning Outcome 3: Formulate hypotheses, mathematical models or narratives that are consistent with quantitative data.

Assignment #3 – Data visualization

Description: Students use R and basic statistical functions/models to visualize data on Cumulative total vaccine doses administered (TOTAL_VACCINATIONS) and the number of persons who took the last vaccine dose. These include histograms, box plots, and scatter plots. Students will be also build advanced graphic visualizations, such as side-by-side graphs. Next, they will explain how the results can help to prevent and explain the spread of diseases.

Evaluation criteria: Students are evaluated based on correct responses, as the questions are objective and specific, with precise numerical answers expected.

Feedback: The assignment are published in Canvas. The deadline for submitting an assignment is one week after the due date in Canvas. Assignment notes will be made available to students a week after the deadline.

See end of syllabus for Assignment details. (p.9)

QTRS Learning Outcome 4: Communicate how quantitative data, interpretations, or models are connected to outcomes, predictions, decisions, explanations, or future states.

Assignment #4 – Test of hypotheses

Description: Students use R and both parametric and nonparametric methods to determine whether the richness of exotic plant species differs among sites. They will also use statistical functions/models to visualize richness data. Students will also build and test the influence of fertilizers on plant growth and assess whether these tests would be employed using parametric and nonparametric data.

Evaluation criteria: Students are evaluated based on correct responses, as the questions are objective and specific, with precise numerical answers expected. The last question is subjective, which students will use the previous results to conclude whether fertilizer will significantly increase plant height.

Feedback: The assignment are published in Canvas. The deadline for submitting an assignment is one week after the due date in Canvas. Assignment notes will be made available to students a week after the deadline.

See end of syllabus for Assignment details. (p.9)

QTRS Learning Outcome 5: Effectively employ one or more digital tools to demonstrate quantitative reasoning, interpretations of calculations, or the creation and evaluation of visualizations.

Assignment #5 – Non-parametric and parametric tests

Description: Students use R and both parametric and nonparametric methods to determine whether the abundance of mammals differs between seasons and whether spatial conservation values, a measure used to identify important areas for conservation, differ between ecoregions.

In both activities, students will formulate the null and alternative hypotheses, visualize the data, and use the t-test or the Wilcoxon test to determine whether to accept or reject the null hypothesis.

Evaluation criteria: Students are evaluated based on correct responses, as the questions are objective and specific, with precise numerical answers expected.

Feedback: The assignment are published in Canvas. The deadline for submitting an assignment is one week after the due date in Canvas. Assignment notes will be made available to students a week.

See end of syllabus for Assignment details. (p.9)

List all course-specific learning outcomes. Where appropriate, identify the associated QTRS learning outcome(s) in brackets (see below for example). Note: It is expected that a majority of course-specific learning outcomes will be associated with a QTRS learning outcome.

Students completing this course will be able to:
• Formulate and test scientific hypotheses. [QTRS LO3]
• Understand types of biological data. [QTRS LO1, QTRS LO2]
• Use R software. [QTRS LO1, QTRS LO5]
• Perform statistical analysis in the context of a realist project.[QTRS LO1, QTRS LO3, QTRS LO5]
• Draw conclusions about scientific facts from data. [QTRS LO4, QTRS LO5]

Form Submission - Proposer

Submitted for Approval | Proposer

Leah Capps - January 30, 2026 at 12:50 PM (America/Phoenix)

Department Approval

Approved

Aaron Hess

Kielii Lilavois - January 30, 2026 at 1:15 PM (America/Phoenix)

Manuel Aviles-Santiago

Trisha Eardley

GSC Coordinator Review

Approved

Kimberly Singleton - February 2, 2026 at 7:47 AM (America/Phoenix)

April Randall

Assistant Vice Provost Review

Approved

Tamiko Azuma - February 2, 2026 at 11:24 AM (America/Phoenix)

All required components confirmed.

Pre-GSC Meeting

Approved

Kimberly Singleton

April Randall - February 5, 2026 at 3:20 PM (America/Phoenix)

Quantitative Reasoning (QTRS) Subcommittee

Acknowledgement Requested

Samantha Anderson

Jason Nichols

Terri Kurz - February 24, 2026 at 12:23 PM (America/Phoenix)

Revise and resubmit: The applicant needs to provide more details to assure compliance with QTRS

Elizabeth Kizer

General Studies Council Meeting

Waiting for Approval

Kimberly Singleton

April Randall

Proposer Notification

Notification

Leah Capps

College Notification

Notification

Trisha Eardley