Student Learning Outcomes/Objectives, with Any Associations and Related Measures, Targets, Findings, and Action Plans

SLO 1: Critical Thinking Skills
Students are able to explain the importance of methodical data collection and reducing variation. Students are able to set up statistical experiments and analyze the results for the purpose of making decisions in an industrial business environment.

Relevant Associations:
Standard Associations

New Core Component Areas
8 Mathematics (MA)
New Core Objectives
1 Critical Thinking (CT)
3 Empirical & Quantitative Skills (EQS)

Related Measures

M 1: Standard Test
Tests containing quantitative questions and multiple choice questions will be administered. Rubrics pertaining to the test will be used to assess the students as a class. No individual grades will be generated.

The topics of the questions Test 1 are:

Critical thinking:

Students will be able to explain the importance of linear programming.

Students will be able to explain the importance of linear equations.

Empirical and Quantitative Skills:

Students will be able to compute measures of central location, coefficient of determination, coefficient of correlation

Students will be able to identify, create and solve linear programming problems

Students will be able to identify, create and solve linear equations

Students will be able to analyze data using basic descriptive techniques.

The topics of the questions Test 2 are:

Critical thinking:

Students will be able to calculate basic probability and apply basic probability to real life situations

Students can recognize and apply continuous probability distributions

Students will understand the laws of expected value and marginal probabilities

Students will be able to recognize and use continuous probability distributions

Empirical and Quantitative Skills:

Students will be able to calculate basic probability

Students will be able to compute and apply marginal probabilities.
The topics of the questions Test 3 are:

**Critical thinking:**

Students will be able to use a sampling distribution for inference

Students are able to interpret point and interval estimators

Students are able to set up a test of hypothesis and interpret results

**Empirical and Quantitative Skills:**

Students make extensive use of sampling distribution for inference

Students can compute test statistics and rejection regions

**Source of Evidence:** Standardized test of subject matter knowledge

**Target:**

At least 75% of the students should have an evaluation of 2.5 or better in a scale from 1 to 4 in the critical thinking evaluations rubric.

**SLO 2: Communication Skills**

Students write an extensive technical report, an executive summary and make an oral presentation or video production describing the performance of an organization.

**Relevant Associations:**

- **Standard Associations**
  - New Core Component Areas
    - 8 Mathematics (MA)
  - New Core Objectives
    - 2 Communication (COM)

**Related Measures**

**M 2: Final project report and presentation**

The final project for this course has three deliverables. An extensive report, an executive summary and an oral presentation. Other faculty and peer students will be invited to listen to the oral presentation and faculty will evaluate the report and presentation by means of a rubric that will evaluate the Communication skills of the students.

**Source of Evidence:** Capstone course assignments measuring mastery

**Target:**

At least 75% of the students should have an evaluation of 2.5 or better in a scale from 1 to 4 in the communication skills evaluations rubric.

**Oral communication rubric**

**Organization**

4: Organizational pattern (specific introduction and conclusion, sequenced material within the body, and transitions) is clearly and consistently observable and is skillful and makes the content of the presentation cohesive.

3: Organizational pattern (specific introduction and conclusion, sequenced material within the body, and transitions) is clearly and consistently observable within the presentation.

2: Organizational pattern (specific introduction and conclusion, sequenced material within the body, and transitions) is intermittently observable within the presentation.

1: Organizational pattern (specific introduction and conclusion, sequenced material within the body, and transitions) is not observable within the presentation.

**Language**

4: Language choices are imaginative, memorable, and compelling, and enhance the effectiveness of the presentation. Language in presentation is appropriate to audience.

3: Language choices are thoughtful and generally support the effectiveness of the presentation. Language in presentation is appropriate to audience.

2: Language choices are mundane and commonplace and partially support the effectiveness of the presentation. Language in presentation is appropriate to audience.

1: Language choices are unclear and minimally support the effectiveness of the presentation. Language in presentation is not appropriate to audience.
Delivery
4: Delivery techniques (posture, gesture, eye contact, and vocal expressiveness) make the presentation compelling, and speaker appears polished and confident.
3: Delivery techniques (posture, gesture, eye contact, and vocal expressiveness) make the presentation interesting, and speaker appears comfortable.
2: Delivery techniques (posture, gesture, eye contact, and vocal expressiveness) make the presentation understandable, and speaker appears tentative.
1: Delivery techniques (posture, gesture, eye contact, and vocal expressiveness) detract from the understandability of the presentation, and speaker appears uncomfortable.

Supporting Material
4: A variety of types of supporting materials (explanations, examples, illustrations, statistics, analogies, quotations from relevant authorities) make appropriate reference to information or analysis that significantly supports the presentation or establishes the presenter's credibility/authority on the topic.
3: Supporting materials (explanations, examples, illustrations, statistics, analogies, quotations from relevant authorities) make appropriate reference to information or analysis that generally supports the presentation or establishes the presenter's credibility/authority on the topic.
2: Supporting materials (explanations, examples, illustrations, statistics, analogies, quotations from relevant authorities) make appropriate reference to information or analysis that partially supports the presentation or establishes the presenter's credibility/authority on the topic.
1: Insufficient supporting materials (explanations, examples, illustrations, statistics, analogies, quotations from relevant authorities) make reference to information or analysis that minimally supports the presentation or establishes the presenter's credibility/authority on the topic.

Central Message
4: Central message is compelling (precisely stated, appropriately repeated, memorable, and strongly supported.)
3: Central message is clear and consistent with the supporting material.
2: Central message is basically understandable but is not often repeated and is not memorable.
1: Central message can be deduced, but is not explicitly stated in the presentation.

Written communication rubric

Context of and Purpose for Writing
Includes considerations of audience, purpose, and the circumstances surrounding the writing task(s).
4: Demonstrates a thorough understanding of context, audience, and purpose that is responsive to the assigned task(s) and focuses all elements of the work.
3: Demonstrates adequate consideration of context, audience, and purpose and a clear focus on the assigned task(s) (e.g., the task aligns with audience, purpose, and context).
2: Demonstrates awareness of context, audience, purpose, and to the assigned tasks(s) (e.g., begins to show awareness of audience's perceptions and assumptions).
1: Demonstrates minimal attention to context, audience, purpose, and to the assigned tasks(s) (e.g., expectation of instructor or self as audience).

Content Development
4: Uses appropriate, relevant, and compelling content to illustrate mastery of the subject, conveying the writer's understanding, and shaping the whole work.
3: Uses appropriate, relevant, and compelling content to explore ideas within the context of the discipline and shape the whole work.
2: Uses appropriate and relevant content to develop and explore ideas through most of the work.
1: Uses appropriate and relevant content to develop simple ideas in some parts of the work.

Genre and Disciplinary Conventions
Formal and informal rules inherent in the expectations for writing in particular forms and/or academic fields
4: Demonstrates detailed attention to and successful execution of a wide range of conventions particular to a specific discipline and/or writing task (s) including organization, content, presentation, formatting, and stylistic choices.
3: Demonstrates consistent use of important conventions particular to a specific discipline and/or writing task(s), including organization, content, presentation, and stylistic choices.
2: Follows expectations appropriate to a specific discipline and/or writing task(s) for basic organization, content, and presentation.
1: Attempts to use a consistent system for basic organization and presentation.

Sources and Evidence
4: Demonstrates skillful use of high-quality, credible, relevant sources to develop ideas that are appropriate for the discipline and genre of the writing.
3: Demonstrates consistent use of credible, relevant sources to support ideas that are situated within the discipline and genre of the writing.
2: Demonstrates an attempt to use credible and/or relevant sources to support ideas that are appropriate for
the discipline and genre of the writing.
1: Demonstrates an attempt to use sources to support ideas in the writing.

**Control of Syntax and Mechanics**
4: Uses graceful language that skillfully communicates meaning to readers with clarity and fluency, and is virtually error-free.
3: Uses straightforward language that generally conveys meaning to readers. The language in the portfolio has few errors.
2: Uses language that generally conveys meaning to readers with clarity, although writing may include some errors.
1: Uses language that sometimes impedes meaning because of errors in usage.

**SLO 3: Empirical and Quantitative Skills**
Students are able to set up and calculate linear equations and probability models. Students are able to calculate results in a statistical experiment including measures of centrality, discrete and continuous variables, methods of estimation and hypothesis testing.

**Relevant Associations:**
- **Standard Associations**
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  - **New Core Objectives**
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**Related Measures**

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**The topics of the questions Test 1 are:**

**Critical thinking:**
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- Students will be able to explain the importance of linear equations.

**Empirical and Quantitative Skills:**
- Students will be able to compute measures of central location, coefficient of determination, coefficient of correlation.
- Students will be able to identify, create and solve linear programming problems.
- Students will be able to identify, create and solve linear equations.
- Students will be able to analyze data using basic descriptive techniques.

**The topics of the questions Test 2 are:**

**Critical thinking:**
- Students will be able to calculate basic probability and apply basic probability to real life situations.
- Students can recognize and apply continuous probability distributions.
- Students will understand the laws of expected value and marginal probabilities.
- Students will be able to recognize and use continuous probability distributions.

**Empirical and Quantitative Skills:**
- Students will be able to calculate basic probability.
- Students will be able to compute and apply marginal probabilities.
The topics of the questions Test 3 are:

**Critical thinking:**

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Students are able to interpret point and interval estimators

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**Empirical and Quantitative Skills:**

Students make extensive use of sampling distribution for inference

Students can compute test statistics and rejection regions

Source of Evidence: Standardized test of subject matter knowledge

**Target:**

At least 75% of the students should have an evaluation of 2.5 or better in a scale from 1 to 4 in the empirical and quantitative skills evaluations rubric.