### Program: BA Economics

#### Learning Objective 1A: Students who graduate will formulate mathematical models to solve microeconomic problems.

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<tbody>
<tr>
<td>ECON 3000</td>
<td>Faculty will use course final exam as assessment artifact.</td>
<td>60% of students will score &gt;/= to 70%</td>
<td>61% of students met benchmark</td>
<td>72% of students met benchmark; 28% of students did not meet benchmark</td>
<td>78% of students met benchmark; 22% of students did not meet benchmark</td>
<td>78% of students did not meet benchmark</td>
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**Improvements:**
- Winter 2015: [n = 30]
- 72% of students met benchmark; 28% of students did not meet benchmark.

**Assessments:**
- Winter 2015: [n = 30]
- 60% of students met benchmark; 40% of students did not meet benchmark.

**Redesigned Act System:**
- Winter 2015: [n = 30]
- 70% of students met benchmark; 30% of students did not meet benchmark.

#### Learning Objective 2A: Students who graduate will formulate mathematical models to solve macroeconomic problems.

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<tbody>
<tr>
<td>ECON 3005</td>
<td>Faculty will use course final exam as assessment artifact.</td>
<td>50% of students will score &gt;/= to 70%</td>
<td>50% of students met benchmark</td>
<td>77% of students did not meet benchmark</td>
<td>78% of students did not meet benchmark</td>
<td>72% of students did not meet benchmark</td>
</tr>
</tbody>
</table>

**Improvements:**
- Winter 2014: [n = 30]
- 77% of students did not meet benchmark.

**Assessments:**
- Winter 2014: [n = 30]
- 47% of students met benchmark; 53% of students did not meet benchmark.

**Redesigned Act System:**
- Winter 2015: [n = 30]
- 50% of students met benchmark; 50% of students did not meet benchmark.

**Assessments:**
- Winter 2015: [n = 30]
- 58% of students did not meet benchmark.

**Assessments:**
- Winter 2016: [n = 30]
- 46% of students did not meet benchmark.

**Assessments:**
- Winter 2017: [n = 27]
- 22% of students met benchmark; 78% of students did not meet benchmark.

**Assessments:**
- Winter 2018: [n = 27]
- 23% of students met benchmark; 77% of students did not meet benchmark.

**Assessments:**
- Winter 2019: [n = 26]
- 42% of students met benchmark; 58% of students did not meet benchmark.

**Closing the Loop:**
- As of Fall 2018, BS Economics students are required to take an additional course (ECON 210) that applies mathematical and statistical tools to analyze microeconomic and macroeconomic problems. Problem-solving skills relevant to this objective require algebra, basic graphing, and calculus. These skills are emphasized in ECON 210.

#### Assessment of Learning Objective 1 was moved from ECON 300 to ECON 301. One of four questions on the ECON 301 final exam is now a decision problem with optimization. It has familiar elements but is not the type of problem students have seen before. 39% met the benchmark, which is below the benchmark of 70%. However, a deeper analysis reveals evidence that the addition of ECON 210 has been effective. In the class of 44 students, 18 were (or are now classified as) BS Economics students, 24 were BA Economics students, and 2 were other. Of the 17 BS Economics students who took the final, 11 (64.7%) met the benchmark. Of the 23 BA Economics students who took the final, 5 (21.7%) met the benchmark. Since BS Economics students are required to take ECON 210 while the BA Economics are not, this is evidence that past improvement actions have been effective in improving students’ ability to form and solve mathematical problems in economics.

**Improvements:**
- Use “Learning Glass” technology available through Media and Academic Technology Services (MATS) to provide several videos of instructor solving the more algebra and calculus intensive problems in microeconomics. These videos will be posted online to complement in-person instruction. Target is to produce five 15-minute videos covering material from ECON 301 by the end of spring 2020.

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**ECON 3005:** Faculty will use course final exam as assessment artifact. Scores of the individual student exams will be compared to department determined and faculty specific benchmarks for proficiency levels.
Learning Objective 4A: Students who graduate will construct coherent economic policy arguments, grounded in economic theory.

**Assessments:**
- Winter 2016: n = 40

**Improvements:**
1. ECON 3005 changed the textbook in January (Winter Quarter) of 2016. Original textbook was unclear, with several errors and not very systematic. Also provided supplemental materials for deeper understanding of certain core concepts, such as price indices, growth calculus, etc., as well as more practice problems, and more expanded questions for quizzes (that can be varied each year). The question would involve some kind of policy or economic shock (that can be varied each year) and students would be asked to analyze its implications (can substitute this class with another programming language throughout the program will hopefully improve students' skills). Students take CS 100: Programming for Everyone to satisfy the BS Economics programming requirement, and this course teaches Python, using a consistent programming environment.

2. Starting in Fall 2018, students taking ECON 3005 (to be renamed ECON 305) will be required to take an additional class in mathematics and statistics that is taught by the economics faculty: ECON 210: Quantitative Methods for Economists. The class builds upon a required class in calculus (or business calculus) and offers the economics department an opportunity for remediation (if necessary) and the introduction of more advanced skills before students take upper-division economics classes, in particular ECON 305. Problem-solving skills relevant to this objective require algebra, basic graphing, and calculus. These skills will be emphasized in ECON 210.

3. We have also added 305-level classes as pre-requisites to several upper-division electives in the Q2S redesign. Upper division classes with a 300-level pre-requisite will have a 400-level pre-requisite. This will allow faculty to teach more advanced problem-solving skills.

4. Starting in Fall 2018, economics students will be required to take an additional class (ECON 210) that applies mathematical and statistical tools to analyze microeconomic and macroeconomic problems. Problem-solving skills relevant to this objective require algebra, basic graphing, and calculus. These skills are emphasized in ECON 210.

Closing the Loop:

- As of Fall 2018, BS Economics students are required to take an additional class (ECON 210) that applies mathematical and statistical tools to analyze microeconomic and macroeconomic problems. Problem-solving skills relevant to this objective require algebra, basic graphing, and calculus. These skills are emphasized in ECON 210.
- A portion of the final exam was used to assess this learning objective. The portion selected for assessment is a cumulative multi-step/multi-questioned problem that measures student proficiency in the knowledge-based learning objective. BPI scored above the benchmark of 70%. An analysis of the scores indicates that, of the 43 students who took the exam, 23 BA Economics students or from another program and 20 were BS Economics students. 83% of BA Economics or other students met the benchmark and 100% of BS Economics students met the benchmark. Since only BS Economics are required to take ECON 210, the results provide evidence that changes to the Economics program to include ECON 210 have been successful in raising the quantitative skills of students.

**Improvements:**
- Construct a simple macro final exam problem (mathematical in nature) that can be tweaked each year. The question would involve some kind of policy or economic shock (that can be varied each year) and students would be asked to analyze its implications using the quantitative tools that they have learned in macro.

**Additional quantitative assignments that match the level of students’ quantitative skills:**
- Additional quantitative assignments that match the level of students' quantitative skills related to this learning objective.

Learning Objective 4B: Students who graduate will analyze research data using modern statistical software packages.

**Assessments:**
- Winter 2016: \( n = 40 \)

**Improvements:**
- Winter 2016: ECON 4400 added an empirical exercise with a write-up.
- Starting in Winter 2016, we will be creating a second required course in econometrics: ECON 499: Empirical Analysis. It will be the new course in which we assess Objectives 3 and 4. The class will provide an additional opportunity to teach software skills.

In Fall of 2016 and Winter of 2017.

**Overall Rubric Score:** 69% met expectations; Individual Rubric Traits:
- Trait 1: Statistical Methodology, 50%
- Trait 2: Interpretation of Results, 68%
- Trait 3: Software Skills, 50%

**Assessments:**
- Winter 2017: \( n = 34 \)

**Improvements:**
1. Beginning Winter 2016, ECON 4400 added an empirical exercise with a write-up.
2. Starting in 2018, we will be creating a second required course in econometrics: ECON 499: Empirical Analysis. It will be the new course in which we assess Objectives 3 and 4. The class will provide an additional opportunity to teach software skills.
3. Starting in 2018, students will be required to take a class in programming fundamentals that is taught by the economics faculty: ECON 211: Programming for Data Analysts. Students can substitute this class with another programming fundamentals class offered by the computer science department. This class will be a pre-requisite for ECON 499: Empirical Analysis.
4. Starting in Fall 2018, economics students will be required to take an additional class in mathematics and statistics that is taught by the economics faculty: ECON 210: Quantitative Methods for Economists. The class builds upon a required class in calculus (or business calculus) and offers the economics department an opportunity for remediation (if necessary) and the introduction of more advanced skills before students take upper-division economics classes. The class will feature a large component using Microsoft Excel to illustrate mathematics and statistics problems.

5. Several courses, including ECON 305: Macroeconomic Theory and ECON 431: Economics of Innovation and Intellectual Property, will feature Microsoft Excel-based assignments, e.g. to estimate the various contributors to economic growth under a Solow growth model.

**Overall Rubric Score:** 75% met expectations; Individual Rubric Traits:
- Trait 1: Statistical Methodology, 64%
- Trait 2: Interpretation of Results, 72%
- Trait 3: Software Skills, 88%

**Assessments:**
- Fall 2018: \( n = 25 \)

**Overall Rubric Score:** 75% met expectations; Individual Rubric Traits:
- Trait 1: Statistical Methodology, 64%
- Trait 2: Interpretation of Results, 83%
- Trait 3: Software Skills, 78%

**Closing the Loop:**

- Results from Fall 2018 reveal that 75% of 25 students met or exceeded the benchmark. This compares to 69% from Winter 2017 and 50% from Winter 2016. The improved assessment results are evidence that adding an empirical exercise with a write-up in Winter 2016, one of the improvement actions, was effective. Also, homework were augmented to include empirical analyses similar to the final project for which assessment is based.

**Improvements:**
- Replace Stata with the Python programming language in ECON 310 and 499. Since many students take CS 100: Programming for Everyone to satisfy the BS Economics programming requirement, and this course teaches Python, using a consistent programming environment throughout the program will hopefully improve students' skills related to this learning objective.

Learning Objective 4C: Students who graduate will analyze research data using modern statistical software packages.

**Assessments:**
- Winter 2016: \( n = 40 \)

**Improvements:**
- Winter 2016: ECON 4400 added an empirical exercise with a write-up.

**Overall Rubric Score:** 69% met expectations; Individual Rubric Traits:
- Trait 1: Statistical Methodology, 50%
- Trait 2: Interpretation of Results, 68%
- Trait 3: Software Skills, 50%

**Assessments:**
- Winter 2017: \( n = 34 \)

**Improvements:**
1. Beginning Winter 2016, ECON 4400 added an empirical exercise with a write-up.
2. Starting in 2018, we will be creating a second required course in econometrics: ECON 499: Empirical Analysis. It will be the new course in which we assess Objectives 3 and 4. The class will provide an additional opportunity to teach software skills.
3. Starting in 2018, students will be required to take a class in programming fundamentals that is taught by the economics faculty: ECON 211: Programming for Data Analysts. Students can substitute this class with another programming fundamentals class offered by the computer science department. This class will be a pre-requisite for ECON 499: Empirical Analysis.
4. Starting in Fall 2018, economics students will be required to take an additional class in mathematics and statistics that is taught by the economics faculty: ECON 210: Quantitative Methods for Economists. The class builds upon a required class in calculus (or business calculus) and offers the economics department an opportunity for remediation (if necessary) and the introduction of more advanced skills before students take upper-division economics classes. The class will feature a large component using Microsoft Excel to illustrate mathematics and statistics problems.
5. Several courses, including ECON 305: Macroeconomic Theory and ECON 431: Economics of Innovation and Intellectual Property, will feature Microsoft Excel-based assignments, e.g. to estimate the various contributors to economic growth under a Solow growth model.

**Overall Rubric Score:** 75% met expectations; Individual Rubric Traits:
- Trait 1: Statistical Methodology, 64%
- Trait 2: Interpretation of Results, 72%
- Trait 3: Software Skills, 88%

**Closing the Loop:**

- Results from Fall 2018 reveal that 75% of 25 students met or exceeded the benchmark. This compares to 69% from Winter 2017 and 50% from Winter 2016. The improved assessment results are evidence that adding an empirical exercise with a write-up in Winter 2016, one of the improvement actions, was effective. Also, homework were augmented to include empirical analyses similar to the final project for which assessment is based.

**Improvements:**
- Replace Stata with the Python programming language in ECON 310 and 499. Since many students take CS 100: Programming for Everyone to satisfy the BS Economics programming requirement, and this course teaches Python, using a consistent programming environment throughout the program will hopefully improve students' skills related to this learning objective.

Learning Objective 4D: Students who graduate will construct coherent economic policy arguments, grounded in economic theory.
ECON 4400: Faculty will use embedded assignment as assessment artifact. Scores of the individual student assignments will be compared to department determined and faculty specific benchmarks for proficiency.

70% of students will meet expectations.

Redesigned AoL System

Assessments:
Winter 2016: \(n = 40\)
- Overall Rubric Score: 44% met expectations
- Individual Rubric Traits:
  - Trait 1: Context/Purpose, 63%
  - Trait 2: Economic Theory, 28%
  - Trait 3: Written Exposition, 40%

Improvement:
1. Added written component to develop student qualitative skills.

Assessments:
Winter 2017: \(n = 34\)
- Overall Rubric Score: 72% met expectations
- Individual Rubric Traits:
  - Trait 1: Context/Purpose, 89%
  - Trait 2: Economic Theory, 59%
  - Trait 3: Written Exposition, 68%

Improvements:
1. Beginning Winter 2016, ECON 4400 added an empirical exercise with a write-up.
2. Starting in 2018, we will be creating a second required course in econometrics: ECON 499: Empirical Analysis. This will be the new course in which we assess Objectives 3 and 4. This class will feature several (e.g. 3-4) large assignments giving students practice in conducting and communicating economic research. It will also give faculty several opportunities to give meaningful feedback on students’ communication skills (in this case written communication skills).

Assessments:
Fall 2018: \(n = 25\)
- Overall Rubric Score: 77% met expectations
- Individual Rubric Traits:
  - Trait 1: Context/Purpose, 92%
  - Trait 2: Economic Theory, 72%
  - Trait 3: Written Exposition, 68%

Closing the Loop:
Results from Fall 2018 reveal that 77% of 25 students met or exceeded the benchmark. This compares to 72% from Winter 2017 and 44% from Winter 2016. The improved assessment results are evidence that adding an empirical exercise with a write-up in Winter 2016, one of the improvement actions, was effective.

Improvements:
- In part to address related concerns, the Economics program at CSUEB was transformed beginning Fall 2018 to include a second required course in econometrics following ECON 310 (ECON 499) to further develop students’ statistics and software/programming skills. Unfortunately, ECON 499 was not offered for the first time until spring 2020 so we are not able to assess the effectiveness of this significant program change. At this point, we will not consider further improvement actions until feedback from ECON 499 becomes available.

Footnotes:
* Totals may not add up to 100 due to rounding.