

**2006-2007 :: Graduate Certificate in Economic and Demographic Data Analysis****1. Mission Statement:**

The Certificate in Economic and Demographic Data Analysis is designed to inculcate in graduate students good understanding of the importance of statistical analysis in a wide array of applied and research areas including demography, economics, and planning and to give students the analytical tools to allow them to effectively use different types of statistical analysis in an array of settings. The certificate is designed for students in degree programs, including PhD programs of study who expect to conduct empirically based research during and following their program of study as well as non-degree students seeking to gain new skill sets important for career advancement

**2. Objectives:****2.1 Understanding Concepts:**

Student will understand basic statistical concepts and principles including measures of central tendency and dispersion, and probability

**2.1.1 Related General Education Outcome Item(s):** 11. Advanced Knowledge in Discipline(s); 15. Research & Design

**2.1.2 Related Strategic Plan Item(s):** II-1 The Education of Leaders

**2.1.3 Student Related Objective:** Yes - This is a student related objective.

**2.2 Statistical Techniques:**

Students will analyze data that are typical of research conducted in the social sciences including economic, political, social and demographic data using different statistical techniques

**2.2.1 Related General Education Outcome Item(s):** 11. Advanced Knowledge in Discipline(s); 15. Research & Design

**2.2.2 Related Strategic Plan Item(s):** II-1 The Education of Leaders

**2.2.3 Related Institutional Priority Item(s):**

COM-4 Enhance research, graduate education and technology-driven economic development

**2.2.4 Student Related Objective:** Yes - This is a student related objective.

**2.3 Data Analysis Methods:** Students will be able to assess between competing methodological approaches in analyzing data

**2.3.1 Related General Education Outcome Item(s):** 11. Advanced Knowledge in Discipline(s); 15. Research & Design

**2.3.2 Related Strategic Plan Item(s):** II-1 The Education of Leaders

**2.3.3 Related Institutional Priority Item(s):**

COM-4 Enhance research, graduate education and technology-driven economic development

**2.3.4 Student Related Objective:** Yes - This is a student related objective.

**2.4 Practical Application:**

Students will be able to analyze and interpret results of different analytic techniques in different statistical contexts

**2.4.1 Related General Education Outcome Item(s):** 11. Advanced Knowledge in Discipline(s); 15. Research & Design

**2.4.2 Related Strategic Plan Item(s):** II-3 Investment in People

**2.4.3 Related Institutional Priority Item(s):**

COM-4 Enhance research, graduate education and technology-driven economic development

**2.4.4 Student Related Objective:** Yes - This is a student related objective.

**3. Measures & Findings:**

**3.1 Obtaining working knowledge of basic data collection, analysis, and interpretation.:** Students will obtain necessary skills for basic statistical analysis by taking PA/POEC 5313, offered in Summer and Fall 2007

**3.1.1 Assessment Timeframe:** Summer and Fall 2007

**3.1.2 Success Criteria:**

More than half of the students taking the course admit to being well-equipped to take higher level coursework in statistical analysis, and sign up for higher-level courses in following semesters.

**3.1.3 Related Objective(s):** Understanding Concepts; Data Analysis Methods

**3.1.4 Results Related To Success Criteria:** Not offered in Spring, hence inconclusive results

**3.1.5 Numerical Results:** Not offered in Spring 2007

**3.1.6 Influencing Factors:** Not offered in Spring 2007

**3.1.7 Achievement Level:** Met

**3.1.8 Further Action:** No

**3.2 Obtaining skill sets that build upon basic statistical skills using advanced software programming:** Students will learn to use STATA for advanced statistical analysis including multivariate regression analysis and beyond for large and small datasets by taking POEC 5316 Advanced Regression Analysis

**3.2.1 Assessment Timeframe:** Spring 2007**3.2.2 Success Criteria:**

More than half of the students will admit to being equipped to take individual courses such as Time Series Analysis or Structural Equations Modeling, which they can enroll into in future semesters

**3.2.3 Related Objective(s):** Statistical Techniques; Practical Application**3.2.4 Results Related To Success Criteria:**

About half the students in the POEC 5316 class will go on to take advanced statistical classes in future semesters. However, it must also be noted that most of the students taking the Advanced Regression Course have not formally committed to being interested in the Degree Certificate at the this time.

**3.2.5 Numerical Results:**

Students worked on empirical problems and papers proving that they were reasonably well-equipped to take on higher level statistical coursework in following semesters.

**3.2.6 Influencing Factors:** Instructor involvement and support encouraged students to meet expectations.**3.2.7 Achievement Level:** Met**3.2.8 Further Action:** No

**3.3 Advanced statistical skill sets will be obtained by students for raw data analysis using different types of statistical software such as RATS, SAS, STATA.:**

Students can register for ECO 5311 Applied Econometrics or POEC 6318 Structural Equation Modeling or POEC 6344 Categorical and Limited Dependent Variables, to achieve stated objectives

**3.3.1 Assessment Timeframe:** Spring 2007 for ECO 5311; Fall 2007 or beyond for POEC 6318 and POEC 6344**3.3.2 Success Criteria:**

At least half of the students enrolled in ECO 5311 or POEC 6318 Structural Equations Modeling or POEC 6344 Categorical and Limited Dependent Variables are able to write a empirical research paper successfully

**3.3.3 Related Objective(s):** Statistical Techniques; Data Analysis Methods; Practical Application**3.3.4 Results Related To Success Criteria:**

It was noted that at least 50% of the students performed satisfactorily in exams and the empirical paper writing requirement. Again, it is important to note that all the students taking these classes are not formally enrolled in the Certificate program in any way at the given time.

**3.3.5 Numerical Results:**

All the students performed detailed empirical analysis, indicating an acceptable standard of statistical research skill set. This paper prepares the students for taking another higher level statistical analysis course in or out of the Certificate program requirements.

**3.3.6 Influencing Factors:** Instructor involvement and support encouraged students to meet expectations**3.3.7 Achievement Level:** Met**3.3.8 Further Action:** No

**3.4 Additional statistical and analytical skills should be obtained for a more fully-developed repertoire of skills:**

Students have the option of registering for ECO 5311 or POEC 6318 or POEC 6344 or other approved courses including GISC 6381 (Intro. to GIS), POEC 7304 (Cost Benefit Analysis)

**3.4.1 Assessment Timeframe:** Spring 2007 and beyond**3.4.2 Success Criteria:**

At least half of the students enrolled in ECO 5311 or POEC 6318 Structural Equations Modeling or POEC 6344 Categorical and Limited Dependent Variables are able to write a second or more advanced empirical research paper successfully.

**3.4.3 Related Objective(s):** Data Analysis Methods; Practical Application**3.4.4 Results Related To Success Criteria:**

Most students performed at acceptable or good levels on the empirical project/paper writing requirements for these courses.

**3.4.5 Numerical Results:**

All the students performed detailed empirical analysis, indicating an acceptable standard of statistical research skill set. Students who met this criteria for the second time (see previous assessment measure 4.3), are likely to proceed and obtain

the Certificate.

**3.4.6 Influencing Factors:** Instructor involvement and support encouraged students to meet expectations.

**3.4.7 Achievement Level:** Met

**3.4.8 Further Action:** No

**3.5 Continous Assessment:** Students will complete quizzes and exams as part of course requirements

**3.5.1 Assessment Timeframe:** Spring 2007

**3.5.2 Success Criteria:**

More than half of the students taking the course admit to being well-equipped to take higher level coursework in statistical analysis, and sign up for higher-level courses in following semesters.

**3.5.3 Related Objective(s):** Understanding Concepts; Statistical Techniques

**3.5.4 Results Related To Success Criteria:** POEC 5313 was not offered in Spring 2007

**3.5.5 Numerical Results:** Course not offered in Spring 2007

**3.5.6 Influencing Factors:** Course not offered in Spring 2007

**3.5.7 Achievement Level:** Met

**3.5.8 Further Action:** No

**3.6 Course Evaluation:** Students will complete course evaluations

**3.6.1 Assessment Timeframe:** Every semester

**3.6.2 Success Criteria:**

80% of students will rate course as a whole (including instructor effectiveness) at 3 or better in course evaluations

**3.6.3 Related Objective(s):** Understanding Concepts; Statistical Techniques; Data Analysis Methods; Practical Application

**3.6.4 Results Related To Success Criteria:** Course evaluation results not available at the time of this report

**3.6.5 Numerical Results:** Course evaluation results not available at the time of this report

**3.6.6 Influencing Factors:** Course evaluation results not available at the time of this report

**3.6.7 Achievement Level:** Met

**3.6.8 Further Action:** No

**3.7 Research Paper:** Students will write research paper in POEC 5316

**3.7.1 Assessment Timeframe:** Spring 2007

**3.7.2 Success Criteria:**

More than half of the students will admit to being equipped to take individual courses such as Time Series Analysis or Structural Equations Modeling, which they can enroll into in future semesters

**3.7.3 Related Objective(s):** Statistical Techniques; Data Analysis Methods; Practical Application

**3.7.4 Results Related To Success Criteria:**

About half the students in the POEC 5316 class will go on to take advanced statistical classes in future semesters. However, it must also be noted that most of the students taking the Advanced Regression Course have not formally committed to being interested in the Degree Certificate at the this time.

**3.7.5 Numerical Results:**

All students worked on joint and individual presentations alongside the paper, indicating that at least half of them have an ability and a willingness to possibly take advanced statistical classes in the future.

**3.7.6 Influencing Factors:** Instructor involvement and support encouraged students to meet expectations.

**3.7.7 Achievement Level:** Met

**3.7.8 Further Action:** No

## 5. Closing the Loop:

**5.1 No further action is required for the Certificate related courses:** Courses fall under other majors, supporting the idea that the major degree programs will take any required action relevant for improving (if required) the courses that fall under the Certificate program

**5.1.1 Related Objective(s):** Understanding Concepts; Statistical Techniques; Data Analysis Methods; Practical Application

**5.1.2 Related Measure(s):**

Obtaining working knowledge of basic data collection, analysis, and interpretation.; Obtaining skill sets that build upon basic statistical skills using advanced software programming; Advanced statistical skill sets will be obtained by students for raw data analysis using different types of statistical software such as RATS, SAS, STATA.; Additional statistical and analytical skills should be obtained for a more fully-developed repertoire of skills; Continuous Assessment; Course Evaluation; Research Paper

**5.1.3 Responsible Person:** Program Heads of the major degree programs

**5.1.4 Target Date:** Summer and Fall 2007

**5.1.5 Priority:** Low Priority

## 6. Analysis:

### 6.1 Program/Unit Strengths:

#### 6.1.1 Objectives/Outcomes Exceeded or Met:

All the core objectives for the Certificate were successfully met by the students and corresponding Instructors

#### 6.1.2 Other Strengths:

Students performance suggests that they possess requisite knowledge of working statistical concepts and principles, methodological techniques, and understanding of data interpretation.

### 6.2 Program / Unit Weaknesses:

#### 6.2.1 Objectives / Outcomes Partially or Not Met: None relevant

#### 6.2.2 Other Weaknesses:

The courses are under the umbrella of other degree programs, which takes away the decisions to offer courses from Certificate Director

### 6.3 Other Areas Needing Improvement:

We still need more efforts at co-ordinating course material given the fact that we have multiple instructors teaching the same course. We also need more co-ordination between basic and advanced courses.

## 7. Report:

### 7.1 Executive Summary:

The Certificate is meeting the basic goals of providing students with an adequate foundation in economic, statistical and demographic analysis. It emphasizes real world applications and professional development outside of the academic setting and provides intellectual tools for students pursuing advanced degrees in economics, public affairs, public policy and political economy, geospatial sciences, and other areas. The Certificate is organized in a fashion that allows for most students to complete the certificate program in a 3 to 4 semester time frame with at least one and typically two courses being offered in each semester. ECO 5311 and POEC 5316 were offered in Spring 2007, providing students with the advanced and practical aspects of the Certificate.

The Certificate program seeks to develop advanced statistical skills and analytic ability for both graduate non-degree and degree-seeking students. Based upon our assessment of student performance which incorporates student self-evaluation, student performance in specific facets of their courses, including examinations and research papers that require obtaining, analyzing and interpreting raw data, as well as our discussions with students upon completion of program, we believe the Certificate is meeting the needs of students and the University as stated in the mission statement. We will continue with efforts to develop greater co-ordination and integration of goals, that are across a diverse array of courses that are part of the program.

While faculty that are part of the program have coordinated among themselves via email exchanges, we expect, beginning Fall 2007, to meet with relevant stakeholders to discuss further development and improvement in the Certificate Program.

### 7.2 Top 3 Program/Unit Accomplishments: Two students completed Certificate program in 06-07 Academic Year.

We have been successful in offering multiple courses each semester relevant to the Certificate.

We hired one Senior Lecturer who we expect will be able to assist with POEC 5313 and POEC 5316 in future semesters.

A refurbished STATs Lab provides students with updated and latest software in statistical analysis.

### 7.3 Research Activities or Publications:

Please refer to Degree Programs in Economics, Geospatial Sciences, and Public Policy and Political Economy.

### 7.4 Instructional/Training Activities (presented or received): None relevant

### 7.5 Public Service:

Development of statistical skills, including analyses of social data involving social pathologies (Crime, Divorce, etc.) which can be used by practitioners or policy makers to develop intervention plans.

Dr. Bray, who is now the Associate Director of the Williams Institute for Empowerment, is able to incorporate his real-world experiences into the course material.

### 7.6 Other External Activities: None relevant

**7.7 Contributions to UTD:**

The certificate is consistent with the UTD Strategic Initiatives that seek to "preparing students for tomorrow's challenges" as well as "managing change in a constantly changing society." The ability to be conversant with statistics as both a consumer of statistical analyses as well as one who produces such analyses is becoming increasingly important in our technological society. Thus the certificate serves a real need.

**7.8 Top 3 Program / Unit Challenges:**

Learning goals seem to be more likely to be met with one instructor is teaching two or more courses in a sequence such as POEC 5313 and POEC 5316. There are inevitable challenges when different instructors teach the sequence.

Desirable to achieve more co-ordination of statistical applications across the entire range of courses, not just the "core required courses."

Since the Certificate Program requires students to integrate theory into practice, i.e. hands on application, and given the diversity of the students in the program in terms of ability and pre-existing statistical knowledge, it is difficult finding an optimum level of difficulty at which to teach the courses.

**7.9 Detailed Resources Needed to Improve and Fulfill Mission:** None relevant to the Certificate for now. Refer to Program Reports for relevant resources.