

**Proposal to change the name of the certificate in
Analytics and Program Evaluation to Social Impact Analysis**

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Last fall Bruce Wydick, at that time the director of our Westmont in San Francisco program, proposed a four-module post-baccalaureate certificate program in Statistical Analytics and Program Evaluation. The program was approved the Senate and then by the faculty in November 2019. Plans were set to launch the program, but a few disruptions—notably the Covid-19 pandemic—caused us to put the marketing of the program on hold.

Since then, Bruce has decided to leave the directorship of WSF and return to his tenured post at the University of San Francisco. He is still interested in serving in an adjunct role with us and to oversee the launch and management of the certificate program. Our hopes would be that the program could have a summer session (four modules compressed into a summer intensive) and a year-long session (two modules a term). The program could help fill some of the beds in the Clunie House as well.

Actually, the last several months have given us more time to develop the vision and partnerships for the program. Over the past months, Bruce and I have had conversations with key representatives from Baylor, USF, Wheaton, Santa Clara, and Notre Dame. They have all expressed considerable interest in sending students to the program, and we have begun the conversation about creating a “Westmont Consortium” of schools that would collaborate on the program. Westmont would remain the principal partner and the owner of the curriculum, though we could allow other institutions to integrate modules from the program into their own program. In that sense, it would be similar to the schools that have used the CCCU Best Semester programs as the foundations of their own minors (e.g., American Studies Program for a political science minor, the LA Film Studies Program for a film minor, etc.).

The Consortium would relieve Westmont of having to recruit 10-15 students for each cohort. With this new arrangement, Westmont would only have to recruit 3 students each term. The other schools would send 1-3.

In the course of the discussions, we have heard suggestions for a name change to the certificate. Those come from people at other colleges and in the poverty relief industry. So we are proposing a change from Statistical Analytics and Program Evaluation to Social Impact Analysis. The curriculum would remain the same as that passed by the faculty (original proposal is attached below). I support this for a few reasons: 1) It reflects advice from potential partners and employers: and 2) Analytics and Program Evaluation seems generic to almost any field; Social Impact Analysis seems more suggestive of or relevant to social entrepreneurship efforts.

**Proposal Summary for Certificate in
Statistical Analytics and Program Evaluation
Fall 2019**

Motion

To approve the proposal for a four-module Certificate in Statistical Analytics and Program Evaluation, to be offered as a non-credit educational opportunity at the Westmont in San Francisco program. Offerings of the certificate at another site would need to be approved by the Academic Senate.

Program

I. Program Concept: This new post-baccalaureate certificate program seeks to equip college graduates with the modern statistical and analytical tools that are in high demand today in both the non-profit and for-profit sectors. While the analytical skills developed in the certificate program are highly desirable within a wide range of for-profit business, the financial sector, and technology firms, courses in the program will emphasize program and policy evaluation in the context of poverty program interventions domestically and in developing countries. Additionally, students will also read and discuss a number of books and articles that help them to ground modern analytical tools within a Christian worldview that views human flourishing and the common good as central to the purpose of their analytical work.

II. Curriculum: The certificate will consist of four courses:

1. An Introduction to Basic Statistics, Programming In R, and Graphical Design: This course will cover an introduction to basic statistics, z , t , X^2 , and F distributions, confidence intervals, and hypothesis testing. It will help students to become familiar with the survey software and R programming used in student assignments, and help students to create professional-looking graphics.
2. Introduction to Econometrics and Basic Regression Analysis. This course will introduce students to data management and analysis, focusing on Ordinary Least Squares (OLS) regression, the assumptions of the OLS model and how to deal with violations of the basic model such as multi-collinearity, heteroskedasticity, and autocorrelation. and how to build and test regression models with both continuous and discrete variables.
3. Causal Econometrics, Treatment Effects, and Program Evaluation. Valid program evaluation and the testing of treatment effects, broadly defined, requires a strong understanding of causal statistics. In this course students will be introduced to the Rubin causal model and learn about experimental design as well as methods used to identify causal effects such as interrupted time series, difference-in-differences,

pipeline methods, covariate matching, instrumental variables, and regression discontinuity design.

4. **Introduction to Machine Learning.** In the last few years, researchers have begun to use machine learning techniques to ascertain specific populations on which a treatment or intervention exhibits the strongest (and weakest) treatment effects. Students will be introduced to machine-learning algorithms such as the Least Absolute Shrinkage and Selection Operator (LASSO), Ridge Regression, Decision Trees, k-Nearest Neighbor Matching, and Random Forests. Students will be shown the generality and power of these techniques while they are applied most specifically to examples and problems in program evaluation. Classes will be taught mainly using the R programming language and user interface, although Python may be introduced in the final machine-learning class.

Alongside the technical and statistical material in each course, students and faculty will read and discuss a series of articles and books that will help them to ground and integrate technical skills with purposes that are congruent to human flourishing and the common good. In the summer-intensive course, students will typically read a chapter of a book or an article before each class, and the last 20-30 minutes of each class will be devoted to discussion and reflection on values related to pre-professional development, questions of wealth and poverty, and the integration of ideas in the reading to analytical work.

III. Summer-Intensive and Academic-Year Programs: The certificate program will be offered both as a i) summer-intensive course and ii) over a full academic year, where coursework will take place alongside a part-time internship in San Francisco.

1. In the summer-intensive course, each of the four classes will meet for two to three weeks for 3-5 hours per weekday. Courses will be offered consecutively, with subsequent classes building on the material in previous classes for a total of 10-12 weeks. In the summer-intensive program, students will be devoted to coursework full time, and with homework assignments due most days of class, students can expect to be either in class or doing homework projects about 8-10 hours per day, or about 40-50 hours per week.
2. In the academic-year program, students will complete each of the four courses in sequence as in the summer program, but each will take approximately half a semester. The academic-year program will combine the four courses with 1-2 internships in San Francisco that will span the academic year. Some of the internships may be paid, which would significantly lower the costs to students of the overall program. The internships may last one semester or the whole academic year and will serve to give students work experience that complements their classroom learning and provide them an entryway into the world of work. Students will spend approximately 20 hours per week in coursework, and 24 hours per week (three full days) in their internship.

IV. Target Constituency: Initially the certificate program will target three main constituencies of potential students. It may be that enrollment rates become higher in one or two of these groups so that the curriculum may evolve to more closely match the needs of those students. However, the following identifiable groups would make natural applicants:

1. Those working in development or non-profit organizations who desire to obtain the technical skills needed to become experts in policy and program evaluation.
2. Students who are entering masters or doctoral programs that require or could harness modern statistical techniques, but do not have a strong background yet in these areas.
3. Graduated seniors from Christian colleges that have completed majors in fields such as global studies, communication studies, political science, philosophy, history, sociology, psychology, and business, who desire to increase their level of quantitative and analytical skills in order to prepare them for work with non-profit organizations or for-profit businesses.