# A New CSULB Certificate Program:

# Business Analytics Certificate

1. **Program Type: State-Support (Please specify any from the list below that apply—delete the others)**

* *State-Support*

1. **Program Identification**
   1. Campus: *California State University, Long Beach.*
   2. Full and exact degree designation and title: *Business Analytics Certificate.*
   3. Term and academic year of intended implementation: *Fall 2017.*
   4. Name of the departments: *Department of Information Systems and Department of Marketing, College of Business Administration*
   5. Name, title, and rank of the individual(s) primarily responsible for drafting the proposed minor or certificate program.

* *H. Michael Chung, Chair and Professor, Department of Information Systems*
* *Sam Min, Chair and Professor, Department of Marketing*
  1. Statement from the appropriate campus administrative authority that the addition of this program supports the campus mission and will not impede the successful operation and growth of existing academic programs.

*(attached)*

* 1. Any other campus approval documents that may apply (e.g. curriculum committee approvals).

*The Undergraduate Programs Committee of the CBA approved the proposal for Business Analytics Certificate. The minutes of March 10, 2017 meeting is copied.*

March 10, 2017

CBA Undergraduate Programs Committee:

M/S/P Business Analytics Certificate with a suggestion to add more elective courses down the road.

**3. Program Overview and Rationale**

* 1. Rationale, including a brief description of the program, its purpose and strengths, fit with institutional mission, and a justification for offering the program at this time. The rationale may explain the relationship among the program philosophy, design, target population, and any distinctive pedagogical methods.

**Description of program:**

*Department of Information Systems and Department of Marketing propose the following Business Analytics Certificate program comprised of three required courses, three elective courses, and the appropriate pre- or co-requisites for these electives. Depending on the choices of three electives, the total credit units to meet the certificate requirement could be 24 to 30 units.*

**Certificate Requirements**

*1) Students must take the following courses.*

*IS 470 Business Intelligence (Pre-Requisite IS 310)*

*IS 310 Business Statistics (Pre-Requisite STAT 118)*

*STAT 118 Introductory Business Statistics*

*2) Students take at least three courses from the following four courses:*

*IS 320 Spreadsheet Modeling for Business and Management*

*(Pre-Requisite IS 233, STAT 118)*

*IS 340 Business Application Programming (Co-requisite IS 300)*

*IS 380 Database Management (Co-requisite IS 300)*

*MKTG 475 Marketing Analytics (Pre-requisite IS 301, IS 310, MKTG 300)*

*The list of pre- and co-requisites in 2) are:*

*IS 233 Office Productivity Software*

*IS 300 Management Information Systems*

*IS 301 Business Communications*

*MKTG 300 Principles of Marketing*

*This certificate program can only be pursued in combination with a degree program (Senate Policy 16-17, 2-1)*

***Purpose and Strengths:***

*Business analytics increasingly plays a fundamental role in business decision-making. The purpose of the Business Analytics Certificate is to help the students acquire analytical skill sets and apply those skills to solve business problems and challenges. In addition, post baccalaureate applicants can meet their professional needs by pursuing the Business Analytics Certificate.*

b. Proposed catalog description, including program description, degree requirements, and admission requirements.

**Business Analytics Certificate**

*The business analytics certificate program provides students the foundation knowledge and skills to organize and analyze business related data in various formats. Students learn how to identify business problems, to develop solution processes, to present descriptive and predictive outcomes, and to make and decisions accordingly. Large data sets, case studies, and practical software tools are utilized.*

**Degree Requirements (Total 24-30 units depending on the choices of three electives)**

* *STAT 118, IS 310, IS 470*
* *Three additional elective courses (IS 320, IS 340, IS 380, MKTG 475)*

*and between 6-12 units of co- and/or pre- requisites for these electives*.

**Admission Requirements**

* *Students must have either sophomore or junior standing, have officially declared a major, and have a minimum overall GPA of 2.5.*

1. **Curriculum** 
   1. Goals for the program and [student learning outcomes](http://www.calstate.edu/acadaff/sloa/index.shtml): (1) Program goals are very broad statements about what the program is intended to achieve, including what kinds of graduates will be produced. (2) Student learning outcomes are more specific statements that are related to the program goals but that more narrowly identify what students will know and be able to do upon successful completion of the program.

*The Business Analytics Certificate curriculum is designed to help students to gain knowledge and skills essential to their career success in business analytics.*

College level student learning outcomes include:

*a. Critical Thinking and Problem Solving Skills*

* *To demonstrate an understanding of how the application of business analytics and big-data management are fundamental to the improvement of business performance.*

*b. Business Ethics*

* *To distinguish ethical corporate actions from ones that are not, and to understand how unethical behavior can lead to a loss of value and decline of a firm.*

*c. Business Functions*

* *To master integrative knowledge of business functional areas to solve business problems.*

*d. Quantitative & Technical Skills*

* *To acquire analytical skills, database management, and statistical tools and apply them to business problems.*

*e. Collaborative and Team Skills*

* *To understand individual differences and enhance interpersonal and teamwork skills.*
  1. Plans for assessing program goals and student learning outcomes.

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| **College Level Learning Goal** | **Course Level Learning Goal** | **Measurement Method  (e.g. objective test, project -- include number of students and sections assessed)** | **Percent of Students who exceed, meet and do not meet expectations** | | | **Action Recommended to Close the Loop (if necessary)** |
| Exceed | Meet | Do not meet |
| **Critical Thinking and Problem Solving Skills** | Plan, develop, and manage information systems to address their information requirements and identify approaches to solve business problems.  IS 320, IS 340, IS 380, IS 470, MKTG 475 | Rubrics  Exam scores  Projects |  | | |  |
| **Business Ethics** | Demonstrate and illustrate the social responsibility of being ethical;  Categorize the causes leading to data and information privacy and security.  IS 320, IS 380, IS 470, MKTG 475 | Rubrics  Exam scores  Case studies |  | | |  |
| **Management Specific Learning Goals - Business Functions** | Understand, identify, and evaluate the current state of the functional area business issues;  Justify and effectively communicate the choice of decision-making strategies and their impact on functional areas.  IS 320, IS 340, IS 380, IS 470, MKTG 475 | Rubrics  Exam scores  Case Studies  Projects |  | | |  |
| **Quantitative and Technical Skills** | Apply quantitative and technical skills to analyze business operations and management.  IS 320, IS 340, IS 380, IS 470, MKTG 475 | Rubrics  Exam scores  Projects |  | | |  |
| **Collaboration and Team Skills** | Understand individual member’s strengths and weaknesses in a team;  Improve collaboration and teamwork skills through working on groups.  IS 380, IS 470, MKTG 475 | Rubrics  Projects |  | | |  |

* 1. Total number of units required for the minor or certificate:

*A minimum of 12 units is required.*

**Requirements**

* *Students must have either sophomore or junior standing officially declared in a major with a minimum overall GPA of 2.5.*
* *Students must take following courses.*
  + *IS 470 Business Intelligence*
  + *IS 310 Business Statistics*
  + *STAT 118 Introductory Business Statistics*
* *Students take at least three courses from the following courses:* 
  + *IS 320 Spreadsheet Modeling for Business and Management*
  + *IS 340 Business Application Programming*
  + *IS 380 Database Management*
  + *MKTG 475 Marketing Analytics*
* *Students take between 6-12 units of prerequisites for the elective courses, depending on specific electives chosen.*

1. A list of all courses *required* for the minor or certificate, specifying catalog number, *title*, units of credit, and prerequisites or co-requisites (ensuring that there are no “hidden” prerequisites that would drive the total units required to graduate beyond the total reported in 4c above).

**STAT 118. Introductory Business Statistics (3)**

Prerequisite: Appropriate ELM score, ELM exemption, or MAPB 11.  
Sampling methods, data collection, organizing and visualizing, descriptive statistics, random variables, probability distributions, point and interval estimation, hypothesis testing, correlation, regression, contingency tables, applications in business, finance, econometrics, and marketing research.

### IS 233. Office Productivity Software (3)

Introduction to using Internet and e-mail, Windows, word processing, spreadsheet, and database applications; basic computer literacy.   
Credit/No Credit grading only.

**IS 300. Management Information Systems (3)**

Prerequisite: IS 233 or equivalent.  
Information systems concepts and components, contemporary organizational applications, development and management of information systems, and future trends. Computer-based team projects requiring integration and application of conceptual and skills-oriented information systems knowledge in business environment.   
Letter grade only (A-F).

### MKTG 300. Principles of Marketing (3)

Prerequisite: None.  
The study of buyer behavior, marketing research, pricing, distribution, promotion, product strategies, and the influence of external factors. The roles of ethics, corporate social responsibility, and public policy that are intrinsic to marketing decision making in global environments are explored. Human Subject Pool participation required.

### IS 301. Business Communications (3)

Analysis of principles of collecting, organizing, analyzing, and presenting business information. Written and oral communications involving problem solving in the business management process.   
Letter grade only (A-F).

### IS 310. Business Statistics I (3)

Prerequisite: STAT 118

Application of statistics to business problems. Data collection and organization, probability theory, measures of central tendency and dispersion, hypothesis testing and estimation, simple regression, and correlation. Use of statistical software.   
Letter grade only (A-F)

### IS 320. Spreadsheet Modeling for Business and Management (3)

Prerequisites: IS 233  
Using spreadsheet to solve business and management problems. Complete coverage of spreadsheet topics including problem formulation, formula, functions, pivot table, macro, solver, spreadsheet forms and VBA, what-if analysis, dimensional analysis, optimization, and quantitative modeling. Data analysis and visualization using spreadsheet.  
Letter grade only (A-F).

### IS 340. Business Application Programming (3)

Corequisite: IS 300

Introduction to business application development. Programming concepts, variables, data types, operators, methods, conditionals and recursion. Classes, objects, encapsulation, inheritance, and polymorphism. User interface and database access. Program design, debug and test.  
Letter grade only (A-F).

### IS 380. Database Management (3)

Corequisite: IS 300

Introduction to database requirements, analysis and specification. SQL query formulation. Database implementation using relational database management system software, such as Oracle. Design of computerized business forms and reports.   
Letter grade only (A-F).

### IS 470. Business Intelligence (3)

Prerequisites: IS 310  
Extract useful information (business intelligence BI) from large volumes of data or Internet using BI software. Theories and applications in business intelligence, data mining, and business analytics. Topics include recommender system, collaborative filtering, classification, clustering, web mining, social network analysis.  
Letter grade only (A-F).

### MKTG 475. Marketing Analytics (3)

Prerequisite: IS 301, IS 310, MKTG 300

Marketing Analytics is an application of data science to marketing decision problems. The course explores customer data analysis techniques and their theoretical foundations to help students acquire analytic skills that can be applied to real world marketing problems. The course also examines the ethical and technical issues related to data privacy.  
Letter grade only (A-F).

1. Attach a proposed course-offering plan for the first three years of program implementation, indicating, where possible, likely faculty teaching assignments.

*These are existing courses. We do not expect that the increase in student enrollment as a result of the proposed Business Analytics Certificate will affect the faculty teaching assignments.*

*Multiple sections of IS233, IS300, IS 301, MKTG 300, IS 310, IS 340, and IS 380 are offered every semester. IS320, IS 470, and MKTG 475 are also offered every semester.*

c. Criteria for student continuation in the program.

*There are no specific criteria for student continuation in the program. As stated in the CSULB Catalog, students may not have to finish a certificate.*

d. Provision for meeting accreditation requirements, if applicable, and anticipated date of accreditation request (including the WASC Substantive Change process).

*N/A*

1. **Need for the Proposed Minor or Certificate Program**
   1. List of other California State University campuses currently offering or projecting the proposed programs; list of neighboring institutions, public and private, currently offering the proposed programs.

**Institutions offering a Certificate program in Business Analytics**

CSU Sacramento:

http://www.cce.csus.edu/business-analyst-certificate-program

<http://www.csus.edu/cba/analytics/certificate.html>

San Jose State University:

<http://www.sjsu.edu/lucasgsb/programs/advanced-certificates/business-analytics/index.html>

Cal Poly San Luis Obispo:

<http://www.cob.calpoly.edu/gradbusiness/certificate-programs/business-analytics/>

CSU Fullerton:

<http://extension.fullerton.edu/ProfessionalDevelopment/Certificates/Business-Analysis>

University of Southern California:

<https://www.marshall.usc.edu/GCRTAnalytics>

University of California Irvine:

<https://ce.uci.edu/areas/business_mgmt/business_analyst/>

**Admission Requirements and Certificate**

|  |  |  |
| --- | --- | --- |
| **University** | **Admission Requirements** | **Certificate or Not** |
| Sacramento State | Experienced Professional | yes |
| San Jose State | 4 year bachelor's degree | yes |
| Cal Poly San Luis Obispo | 4-year bachelor's degree | yes |
| Fullerton | 3 year bachelor's degree/professional Experience | yes |
| USC | 4 year bachelor’s degree | yes |
| USI | 4 year bachelor's degree | yes |

* 1. Differences between the proposed program and programs listed in Section 5a above.

*All of the above certificates require a Bachelor’s degree for admissions except CSU Sacramento that offers the certificate through their extensions. San Jose State University program’s is online only.*

*None of the programs focuses on undergraduate students majoring in business in their respective undergraduate programs.*

* 1. List of other curricula currently offered by the campus that are closely related to the proposed program.

*No other “Business Analytics Certificate” is being offered by CSULB.*

* 1. Community participation, if any, in the planning process. This may include prospective employers of graduates.

*There is no community participation in the planning process since this involves only an offering of a certificate program and no new courses being added.*

* 1. Applicable workforce demand projections and other relevant data.

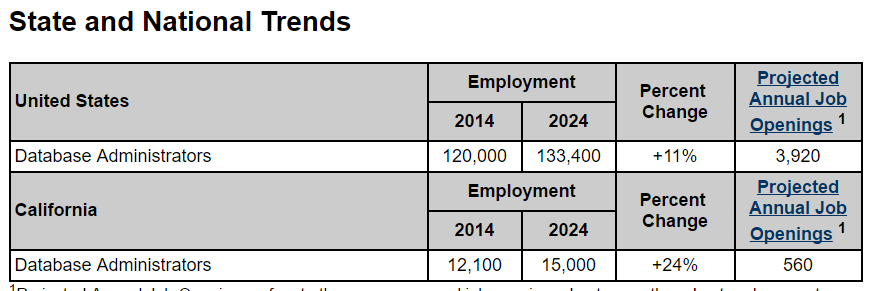
*Recent years have witnessed a growing importance of business analytics in industry. There is increasing demand for students with highly quantitative backgrounds to work in various business fields.*

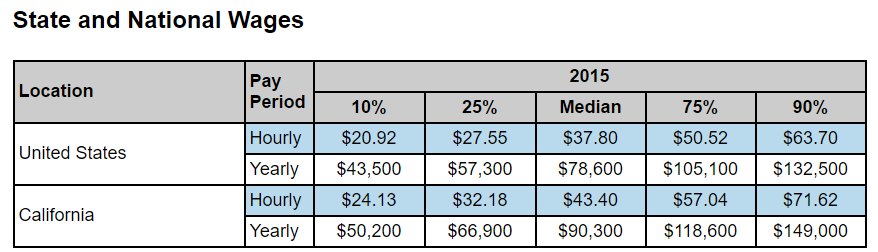
### ****6. Job Prospects****

Data Analyst

*According to McKinsey Global Institute (2013), the demand for deep analytical talent in the United States would be 50 to 60 percent greater than its projected supply by 2018. The result would be a shortage of ‘140,000 to 190,000 with deep analytical skills as well as 1.5 million managers and analysts who know how to leverage data analysis to make effective decisions.’ The projected annual salary level of an entry-level data analyst is between $50,000 and $75,000.*

*According to The Bureau of Labor Statistics (2014), computer and information research scientists invent and design new approaches to computing technology and find innovative uses for existing technologies. They study and solve complex problems in computing for business, medicine, science, and other fields. Computer and information research scientists write algorithms that are used to detect and analyze patterns in very large datasets. They improve ways to sort, manage, and display data. Computer scientists build algorithms into software packages that make the data easier for analysts to use. For example, they may create an algorithm to analyze a very large set of medical data in order to find new ways to treat diseases. They may also look for patterns in traffic data to help clear accidents faster.*





* 1. If the program was proposed to meet society’s need for the advancement of knowledge, please specify the need and explain how the program meets that need.

*Business analytics helps organizations harness their data and use it to identify new opportunities. That, in turn, leads to more effective and faster business decision-making, more efficient operations, and better customer relationship management among others. For example, the ability to gauge customer needs through analytics brings an opportunity to identify new products and services.*

* 1. Student Demand

Compelling evidence of student interest in enrolling in the proposed program. Types of evidence vary and may include national, statewide, and professional employment forecasts and surveys; petitions; lists of related associate degree programs at feeder community colleges; reports from community college transfer centers; and enrollments from feeder baccalaureate programs, for example.

*According to PWC report (*[*https://www.pwc.com/us/en/publications/data-science-and-analytics.html)*](https://www.pwc.com/us/en/publications/data-science-and-analytics.html))*, the best jobs right now in America include titles like data scientist, data engineer, and business analyst. The analyses of 26.9 million US job postings from 2015, the number of job openings asking for analytics skills in 2015 was 2.3 million and expect to grow rapidly in near future.*

* 1. Issues of access considered when planning this program.

*From student enrollment figures over the past few years, we do not expect any potential problem in terms of students’ access to the courses being required in this certificate program.*

* 1. Professional uses of the proposed program.

*Common analytics-enabled jobs are Executive Officer, Data Officer, Director of IT,*

*Human Resources Manager, Financial Manager, and Marketing Manager.*

* 1. The expected number of students in the year of initiation and three years and five years thereafter. The expected number of graduates in the year of initiation, and three years and five years thereafter.

*Year of initiation: 20 expected graduation: 16*

*3-years thereafter: 40 expected graduation: 32*

*5-years thereafter: 60 expected graduation: 48*

1. **Existing Support Resources for the Proposed Minor or Certificate Program**

**Note:** Sections 7 and 8 should be prepared in consultation with the campus administrators responsible for faculty staffing and instructional facilities allocation and planning. A statement from the responsible administrator(s) should be attached to the proposal assuring that such consultation has taken place.

*Existing faculty/staff and resources should be sufficient to meet needs of the proposed program.*

*(Dean’s support letter includes this).*

1. Faculty who would teach in the program, indicating rank, appointment status, highest degree earned, date and field of highest degree, professional experience, and affiliations with other campus programs. For graduate programs, include faculty publications or curriculum vitae.

Note: For all proposed degree programs, a minimum of five full-time faculty members with the appropriate terminal degree should be on the program staff.

* *H. Michael Chung, Ph.D., Professor of Information Systems*
* *C. Sophie Lee, Ph.D., Professor of Information Systems*
* *Ying Liu, Ph.D., Associate Professor of Information Systems*
* *Hongyu Chen, Ph.D., Assistant Professor of Information Systems*
* *Reo Song, Ph.D., Assistant Professor of Marketing*
* *Bruce Wilcox, Candidate for Ph.D., Lecturer of information Systems*

1. Space and facilitiesthat would be used in support of the proposed program.

* *CBA Classrooms*
* *CBA Computer classrooms*
* *CBA Open Access Lab*

c. A report provided by the campus Library, detailing resources available to support the program (discussion of subject areas, volume counts, periodical holdings, etc. are appropriate).

*Electronic Access to online journals and periodicals is available through the University Library*

d. Existing academic technology, equipment, and other specialized materials currently available.

* *CBA Open Access Lab*
* *CBA Computer classrooms*
* *Bloomberg Terminals*
* *Financial Databases*

1. **Additional Support Resources Required**

Note: If additional support resources will be needed to implement and maintain the program, a statement by the responsible administrator(s) should be attached to the proposal assuring that such resources will be provided.

1. Any special characteristics of the additional faculty or staff support positions needed to implement the proposed program.

*Existing faculty/staff and resources should be sufficient to meet the needs of the proposed program.*

1. The amount of additional lecture and/or laboratory space required to initiate and to sustain the program over the next five years. Indicate any additional special facilities that will be required. If the space is under construction, what is the projected occupancy date? If the space is planned, indicate campus-wide priority of the facility, capital outlay program priority, and projected date of occupancy.

*No additional lecture or laboratory space is required.*

*Existing classrooms, laboratory facilities, and technology are sufficient to initiate and sustain program over next five years.*

1. A report written in consultation with the campus librarian, indicating any additional library resources needed. Indicate the commitment of the campus either to purchase or borrow through interlibrary loan these additional resources.

*Current library resources are considered sufficient.*

*Additional resources, if needed, are readily available through interlibrary loans.*

1. Additional academic technology, equipment, or specialized materials that will be (1) needed to implement the program and (2) needed during the first two years after initiation. Indicate the source of funds and priority to secure these resource needs.

*Current technology, equipment, and databases are sufficient to implement and sustain program over two years.*