

UNIVERSITY OF CALIFORNIA, ACADEMIC SENATE

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University of California
1111 Franklin Street, 12th Floor
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February 23, 2017

**AIMÉE DORR
PROVOST AND EXECUTIVE VICE PRESIDENT
UNIVERSITY OF CALIFORNIA**

Re: Approval of Master of Science degree in Business Analytics at UC Irvine

Dear Aimée:

In accordance with the *Universitywide Review Processes For Academic Programs, Units, and Research Units* (the “Compendium”), and on the recommendation of CCGA, the Academic Council has approved UC Irvine’s proposal to establish a self-supporting graduate program leading to a Master of Science degree in Business Analytics.

Because this is a new degree title, and the Assembly of the Academic Senate is not meeting within 30 days of CCGA’s approval, Council must approve the program per Senate Bylaw 125.B.7.

I am enclosing CCGA’s report on its review of the new program, and respectfully request that your office complete the process of obtaining the President’s approval.

Sincerely,

A handwritten signature in blue ink that reads "Jim Chalfant".

Jim Chalfant, Chair
Academic Council

Cc: Academic Council
Senate Director Baxter
Senate Executive Directors



COORDINATING COMMITTEE ON GRADUATE AFFAIRS (CCGA)

Kwai Ng, Chair
kwng@mail.ucsd.edu

ACADEMIC SENATE

University of California
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February 8, 2017

AIMÉE DORR

PROVOST AND EXECUTIVE VICE PRESIDENT – ACADEMIC AFFAIRS

Dear Provost Dorr:

At its February 1, 2017 meeting, the Coordinating Committee on Graduate Affairs (CCGA) voted to approve UC Irvine Paul Merage School of Business proposal for setting up a self-supporting graduate program leading to a Master of Science degree in Business Analytics (MSBA).

The proposed UC Irvine's MSBA curriculum will train students in data management, analytic methods, and business context. The program features three curricular tracks – data analytics, marketing analytics, and operations analytics. It is scheduled to begin in Summer 2017; it will be a one-year full-time self-supporting MS program. Students are required to complete a two-quarter group capstone project.

The program targets students with zero to five years of work experience with a quantitative undergraduate degree. The proposers anticipate an initial class size of 30, to be expanded to 45 in year two, and 60 in year three, with a possibility of up to 80 in year four, depending on the market. The program targets students with zero to five years of work experience with a quantitative undergraduate degree. UC Irvine anticipates that the program will serve half domestic students (three quarters of those from California), and half international students.

Four academics, two UC faculty members and two non-UC academics, agreed to review the program. They included one anonymous external reviewer who serves as area head in a business school with a recognized analytics program, Michael Fry, Professor and Head of the Department of Operations, Business Analytics & Information Systems in the Linder School of Business at the University of Cincinnati, an anonymous UC business school professor who has had an administrative role in a similar program, and Karsten Hansen, Professor of Marketing, Rady School of Management, UC San Diego.

The reviewers were generally positive about the program. They however raised concerns about the technical quality of the curriculum, in particular its "data analytics" component. The University of Cincinnati reviewer pointed out that "big-data" concepts like MapReduce, Hadoop, and certain

statistical concepts did not appear in the required courses, and expressed some concern about the lack of faculty with statistics expertise. Similar concerns were raised by other reviewers.

In response, the proposers pointed out there are a variety of MSBA-specific courses that involve “rigorous and extensive hands-on data analytics work.” They also highlighted courses that specifically cover the tools, techniques, and issues raised by reviewers. In particular, the handling of large data sets with R and Python, and the use of SQL are explicitly covered in required courses, as is Hadoop.

UCPB also reviewed the proposal upon the request of CCGA. UCPB generally supported the program, but raised some concerns about the administration of carry-over funds and a more detailed plan for distribution of return-to-aid funds, among others. UCI has provided thoughtful and extensive answers to address each of these issues. Furthermore, in response to the UCPB report, return to aid was increased to 10%, up from the 7% originally set out in the proposal.

As you know, CCGA’s approval is the last stop of the Academic Senate side of the Systemwide review and approval process except when the new degree title must be approved by the President, under delegated authority from The Board of Regents. This program has CCGA’s approval and we commend it to you. For your reference, I have enclosed the lead reviewer’s final report on this proposal.

Respectfully submitted,



Kwai Ng
Chair, CCGA

cc: Shane White, Academic Council Vice Chair
CCGA Members
Hilary Baxter, Academic Senate Executive Director
Michael LaBriola, Academic Senate Analyst
William Parker, Irvine Division Senate Chair
Natalie Schonfeld, Irvine Division Senate Executive Director
Adriana Collins, Irvine Division Senate Analyst

Enclosures: (1)

Date: January 25th, 2017
To: CCGA
From: Phil Kaminsky, Lead Reviewer

Re: UC Irvine Proposal for Master of Science in Business Analytics

I. Description of Proposed Program

The University of California Irvine (UCI) Paul Merage School of Business has proposed a new Master of Science in Business Analytics (MSBA) self-supporting degree program. The proposed MSBA curriculum will train students in data management, analytic methods, and business context. A novel feature of this MSBA proposal (in contrast to others in the state and nationally) is the incorporation of three curricular tracks – data analytics, marketing analytics, and operations analytics. As is typical for these kinds of programs, the UCI MSBA features a two-quarter group experiential capstone project with a partner company. Ultimately, the program aims to "assist students in landing meaningful jobs; create synergies with existing MBA programs by offering courses that would add value to students in all programs; and leverage the analytics program for new research initiatives and fruitful industry outreach."

As with similar proposals we have seen, the program was created in response to high industry demand for workers trained in this area. The program targets students with zero to five years of work experience with a quantitative undergraduate degree. UCI anticipates that the program will serve half domestic students (three quarters of those from California), and half international students.

The program will be a full-time four quarter one year self-supporting degree, to (subject to approval) begin in Summer 2017. The proposal anticipates an initial class size of 30, to be expanded to 45 in year two, and 60 in year three, and perhaps up to 80 in year four, depending on the market. A letter from the co-director of a similar program at UCSD suggests that these class sizes are conservative. The curriculum consists of eight required courses, and five elective courses, organized into the three tracks listed above. The Merage School has been focused on related fields as part of its strategic mission, and has faculty strength as well as existing relevant courses (and faculty research) in areas related to analytics. This program will leverage existing courses, as well as newly created courses that will also be made available to other qualified students.

The capstone project for the course will involve solving a real business analytics problem for a (typically local) company, and deliverables will include project plans, a final report, and a presentation to executives of the sponsoring firm. The Merage School has experience sourcing projects for its full time program, and does not anticipate problems sourcing projects for this program.

The program will (among other goals) prepare students for the INFORMS Certified Analytics Professional certification. UC Irvine also intends to seek STEM-certification for the program, which will give international students up to 29 months of Optional Practical Training (OPT).

The program initially planned to reserve seven percent of revenue for financial aid, and this was increased to ten percent in response to comments.

II. Program Review

The proposal packet received from UCI includes letters of support from firms including IBM, Deloitte, and Experian, and from the co-chair of the MSBA program at UCSD. These letters are very positive about the program curriculum, and about the prospects of students who graduate from the program. I solicited four reviewers for this program:

- An anonymous external reviewer who serves as area head in a business school with a recognized analytics program.
- Michael Fry, Professor and Head of the Department of Operations, Business Analytics & Information Systems in the Linder School of Business at the University of Cincinnati and former director of the Center for Business Analytics there.
- An anonymous UC reviewer, a UC B-school Professor who has had an administrative role in a similar program
- Karsten Hansen, Professor of Marketing, Rady School of Management, UCSD

These reviewers were generally positive about the program. They identified a variety of program strengths, and raised some issues that the proposers have addressed. In addition, the CPB report raised several minor issues that the proposers subsequently addressed.

a. Strengths of the Proposed Program

All of the reviewers noted strengths of the program. Reviewers highlighted the strength of the faculty (“one of the best in the nation”), the reputation of UC Irvine, the high likelihood of program success, and the employability of program graduates, typically citing statistics from their own programs. Specifically, I asked the reviewers to consider four issues:

Quality and academic rigor of the program: Reviewers noted (with a few exceptions highlighted below) that the program aligns with similar programs nationally, called the academic rigor “solid”, and spoke highly of the strategy for designing the program to have three “tracks”.

Adequacy of facilities and budgets: Reviewer responses are best summarized by one of the reviewers, who wrote “Given the design of the program, it would take gross incompetence to lose money on it.”

Adequacy of the size and expertise of the faculty to administer the program: Reviewers were impressed by the faculty, and saw no issues with the School’s ability to administer the program as designed (although reviewers did very softly encourage the hiring of new faculty in whatever that particular reviewer’s field was).

Applicant pool and placement prospects for graduates: Reviewers highlighted what they believe to be a strong national market in this area, and most reviewers believe that there will be strong demand for the program, and for graduates of the program, although some quibbled with demographic makeup of the class outlined in the proposal (with suggestions that there will perhaps be more international students and fewer undergraduate computer science majors than the proposal suggests).

Overall, reviewers found this to be a well organized degree proposal with a high chance of success and little downside risk.

b. Criticisms of the Proposed Program

The only significant set of criticisms raised by three of the four reviewers was related to a particular aspect of the curriculum design. The University of Cincinnati reviewer pointed out that "big-data" concepts like MapReduce, Hadoop, and certain statistical concepts do not appear in the required courses, and expressed some concern that additional statistics expertise may be a necessary addition to the teaching team. The other non-UC reviewer raised concerns about the apparent omission of in-depth study of certain programming and data management tools such as Hadoop, Spark, and SQL, at least in required courses. This reviewer also expressed a related concern about the number of existing business courses that are used in this program. The more critical UC review categorized the proposed program as "a one-year master's in business with an analytics slant, as opposed to a purely analytics program." This reviewer particularly focused on the number of courses shared with the MBA program, and hinted at some concerns about whether the program as constructed can compete (both for students, and for jobs for those students) with what this reviewer characterized as more hands-on data analytics programs. This reviewer put the new programs at UC Davis and UC San Diego in the category of "more data analytics-oriented" programs than the program proposed here.

The Merage School provided a thoughtful response to these concerns. They highlight courses in the curriculum that specifically address the tools, techniques, and issues raised by reviewers at a hands-on level. In particular, the handling of large data sets with R and Python, and the use of SQL is explicitly covered in required courses, as is Hadoop. In addition, an elective course deals explicitly with MapReduce, Hadoop, and cloud security. The curriculum also has required and elective course covering basic and advanced courses in statistics at level appropriate for hands-on data analysis.

In addition, the proposers point out that while this program is intended to leverage synergies with the existing MBA programs, there are a variety of MSBA-specific courses that involve "rigorous and extensive hands-on data analytics work," and that although some of these courses have names similar to existing less-rigorous MBA courses (although different course numbers and extensions to remove ambiguity), these courses include significantly more hands-on quantitative analysis.

The response also explains how their program is similar to the UCSD program in terms of coverage of data management skills, and that it has more of a "business context" focus than the

UC Davis program, although in their opinion all three have curriculums intended to prepare students to apply data analytics tools to real-world problems.

With respect to a minor issue raised by one of the reviewers, questioning whether domestic computer science students would actually be interested in this type of program, the proposers point out that although they believe that they will be able to attract these students, the success of the program in no way depends on this.

The response also discusses hiring plans that address some of the faculty coverage area-related issues raised by reviewers. One of four new tenure track positions described in the proposal will target an applied statistician, two will have a “strong marketing flavor,” and one will focus on Operations and Decision Technology, addressing minor points raised by some of the reviewers.

Overall, responses to the reviewers are serious and substantial, and in my opinion sufficiently address issues raised by the reviewers.

c. UCPB Review

UCPB “generally supports” the program, but raises some concerns, most notably asking for more clarity around the role and administration of carry-over funds, a decrease in the assumed rate of inflation in the budget analysis, a more detailed plan for distribution of return-to-aid funds, more details about the faculty compensation model, a plan to address concerns about the challenges of securing an adequate number of projects each year, and more explicit information about steady-state enrollment.

UCI has provided thoughtful and extensive answers to address each of these issues. Carryover funds will support essential school functions, including teaching assistantships for doctoral students, improved career services support for state-supported programs, and perhaps the development of an online or hybrid version of this program. Budget analysis was undertaken with the adjusted inflation rate requested by UCPB, and the financial picture of the program was not materially changed. In response to the UCPB report, return to aid was increased to 10% (from 7% in the proposal). The Merage School has an in-house financial aid office that will handle this, and the School anticipates revisiting and adjusting financial aid levels to drive recruitment and enrollment, with a goal of building a cohort that is academically strong and diverse. Merage School faculty teach in a combination of state-supported and self-supported programs, and the school anticipates that this will continue. The MSBA will use a combination of existing faculty lines, adjuncts, and ultimately, new faculty lines for teaching. Teaching outside of a faculty member’s normal load will be identified as Category II Outside Professional Activity, and the \$20K rate is standard in the school. The Merage School is confident in its ability to source capstone projects, given the School’s experience sourcing other experiential projects from its corporate partners. In addition, the School is in the process of building an inventory of data-analytics projects at Southern California firms, and anticipates that some students will identify their own clients (perhaps former employers), and will also have the option to work on a collaborative applied research project with a faculty member. Finally, the initial proposal only projected and analyzed the implications of class size during the first three years of the program, leaving some ambiguity beyond that. In response to the UCPB request, the

proposing team analyzed the implications of expanding beyond sixty students, and found significant economies of scale – the increase to 80 students if the market allows would increase program profitability, although the program will be profitable regardless of whether steady state enrollment increases to 80 students, or remains at 60 students.

Overall, I believe these responses adequately address issues raised by UCPB.

III. Summary and Recommendation

This is a carefully thought out and well-written proposal, which appears to have gone through several rounds of review on campus before reaching CCGA. The proposing team has fully addressed the issues raised by UCPB, as well as by the reviewers. As the reviewers point out, this program is not identical to others in the UC system and in the country, but this strikes me as a strength of the proposal. Furthermore, the proposal appears to have significant upside potential with little downside risk. In view of these observations, I recommend that CCGA approve the program.