

# COLLEGE OF SCIENCE

■ = School ■ = Department ■ = Undergraduate ■ = Graduate program ■ = Interdisciplinary

(x/y) are three-year average (enrollments/graduates)  
Based on AY2012-15 Baseline Data

School of Life Sciences								Phasing Out	Interdisciplinary Programs
Biochemistry & Biophysics	Integrative Biology	Microbiology	Mathematics	Statistics	Physics	Chemistry			
Biochemistry & Biophysics B.S. (190/23)	Zoology B.S. (266/39)	Microbiology B.S. (304/74)	Mathematics B.S. (164/32)	Statistics M.S., Ph.D (42/18)	Physics B.S. (116/24)	Chemistry B.S. (210/36)	General Science B.S. (677/116)	Environ. Science	
Biochem. & Molecular Bio B.S. (PROPOSED)	Biology B.S. (829/120)	BioHealth Sciences B.S. (284/78)	Mathematics M.S., Ph.D (65/18)	Data Analytics M.S., certificate (NEW)	Physics M.S., Ph.D (43/8)	Chemistry M.S., Ph.D (113/19)		Molecular & Cellular Biology	
Biochemistry & Biophysics M.S., Ph.D (26/5)	Zoology M.S., Ph.D (50/6)	Microbiology M.S., Ph.D (36/7)						Water Resources	

College of Science and OSU faculty involvement in M.S. and Certificate in Data Analytics.

This proposed graduate degree and certificate programs will involve faculty from Statistics (Colleges of Science and Agricultural Sciences) as well as other faculty from across the university, including:

- College of Public Health & Human Services
  - Public Health
- College of Engineering
  - Electrical Engineering and Computer Science
- College of Business

## New Academic Program: MS, Graduate Certificate in Data Analytics

### BACKGROUND

#### Program Proposed Start Date

Fall 2016

#### Program Description

There are two new degrees proposed:

- Master of Science (MS) in Data Analytics
- Graduate Certificate in Data Analytics

The link to both programs is found at:

<https://secure.oregonstate.edu/ap/cps/proposals/view/93153>

The proposed programs respond to the increasing demand for new approaches in data management and analysis to more effectively deal with ever-increasing amounts of data. The objective of the proposed programs is to produce trained professionals with data analytic skills. The core courses of the MS program are in statistics and computer science, but the program also recognizes that some of the demand for data analytic skills comes from biology and the health professions, and so the program offers areas of concentration in Health Analytics and Statistics.

#### Program Context

The Department of Statistics will deliver most of the content. The Department of Statistics is located in both the College of Science and College of Agricultural Sciences. All academic budget (Education & General) for the Department of Statistics is from the College of Science. Three core courses offered in the MS program will be delivered by the College of Engineering, School of Electrical Engineering and Computer Science. The Department of Statistics offers an MS and a PhD in Statistics, which include more mathematical and theoretical coursework needed in research to develop new statistical methods. These new programs are more applied and describe the tools used to manipulate, analyze and visualize large data sets.

A widely circulated report on 'Big Data' by McKinsey Global Institute estimates that, by 2018, the United States could face a shortage of 140,000 to 180,000 people with deep analytic skills. These "deep analytic skills" are founded primarily in the disciplines of statistics and computer science.

#### Program Purpose/Relationship to University Mission and Strategic Plan

The OSU Strategic Plan states that we must be on the "forefront of new ideas, research and innovation". Our mission is committed to teaching, research and outreach and engagement to promote economic, social, cultural and environmental progress for the people of Oregon, the nation and the world. This mission is achieved by producing graduates competitive in the global economy. With the increasing ability to collect and store data, many disciplines are now facing the challenges on how to extract patterns and trends from large sets of data to advance their research programs and uncover new opportunities. The programs we propose in data analytics address approaches to make sense of these data in a fast and more efficient manner.

## TAB I

These programs will be delivered entirely online. This will increase our Ecampus degree-seeking enrollments and increase the number of graduates. In addition, we expect the online access will increase the numbers of students across a diverse set of backgrounds and from areas across the state. This will increase the opportunities for Oregonians to obtain an advanced degree without leaving a current job.

### **Need for the Program**

As stated above, the United States could face a shortage of 140,000 to 180,000 people with deep analytic skills. More specifically for Oregon, a market analysis was carried out in 2013 for a certificate program proposed by the Department of Statistics in Applied Statistics/Data Analytics. This analysis found that about 90% of students in similar certificate programs were currently employed, with many aiming to acquire the skills to transition into a new functional area. The analysis noted that “industry professionals with five or more years of experience in positions that require statistical or analytical skills and who seek advancement or transition into new functional areas enroll in applied statistics/analytics programs.” Significantly, students preferentially sought “data analytics” certificates.

There are no similar programs in Oregon. Oregon Health Sciences University (OHSU) has a Department of Medical Informatics and Clinical Epidemiology and offers degrees and certificates in clinical informatics. The OHSU program does not include any statistics classes and focuses more on the practical understanding of the role of information in health care.

### **Program Financials**

The Department of Statistics is currently in the process of hiring two new additional faculty and is planning to hire another faculty member for next year. Attachment 1 lists the details for the development and delivery of these programs. These tables illustrate that we project that the programs will be sustainable by the third year of the program with the assumptions listed below.

## **RECOMMENDATION**

All appropriate University committees and the OSU Faculty Senate have positively reviewed the proposed program. The Provost recommends that the Academic Strategies Committee recommend to the Board that it approve the establishment of an instructional program leading to a MS in Data Analytics and a Graduate Certificate in Data Analytics, effective Fall 2016, pending the approval of the Higher Education Coordinating Commission and the Northwest Commission on Colleges and Universities.

**EXPENSES AND REVENUES**

Table 1: This table summarizes a three-year budget to develop and deliver the proposed on-line programs. It includes the total costs to fully develop the online courses expected over the first two years. The last year represents the cost to deliver the program expected over time.

	2016-2017	2017-2018	2018-2019
<b>Course Design and Development</b>			
ST courses	\$245,000	\$95,000	\$0
CS courses	65,000	0	0
<b>Course Delivery</b>			
ST courses	136,000	262,000	406,000
CS courses	88,000	90,000	93,000
<b>Advising</b>	60,000	61,000	63,000
<b>Equipment Expenses</b>	34,000	0	0
<b>Support Staff</b>	10,000	10,000	10,000
<b>Supplies</b>	1,000	1,000	1,000
<b>TOTAL</b>	<b>\$639,000</b>	<b>\$519,000</b>	<b>\$573,000</b>

We expect the program to be sustainable in its third year based on the following estimates:

- Estimated enrollment: An initial cohort of approximately 10 students is anticipated for Fall Term 2016 in the MS program, when the program will commence. For the 2017-18 academic year, we expect the total enrollment in the MS program to be approximately 20, increasing to 30 by Academic Year 2019-2020. Numbers in the Graduate Certificate program may be higher in the long run, though we anticipate smaller numbers in this program at the outset—5 students in Fall Term 2016, increasing to 15 by Academic Year 2019-20.
- Current cost for a graduate credit taken online at Oregon State University is \$512.

With these assumptions, and using the total costs shown in Table 1, we project the following costs and revenue shown in Table 2.

Table 2: Costs and revenues for the first three years of the programs.

Year	Estimated Revenue (Tuition)	Estimated Cost (see Table 1)
1 <sup>st</sup> year (2016-2017)	\$138,240	\$639,000
2 <sup>nd</sup> year (2017-2018)	\$437,760	\$519,000
3 <sup>rd</sup> year (2018-2019) and after	\$794,880	\$573,000