Board of Regents

ACADEMIC AFFAIRS COMMITTEE MEETING AGENDA

January 26, 2018
Jody Richards Hall
Cornelius A. Martin Regents Room

Mr. John W. Ridley, Chair	Dr. Claus Ernst
Miss. Andi Dahmer	Dr. Tamela W. Smith

Action Items:

AA-1 Approval of Graduate Certificate in Scientific Data [pp 1-5]
AA-2 Approval of Sabbatical Leave Requests [pp 6-7]
AA-3 Approval of Emeritus Appointment [p 8]

Information Items:

- Recruitment Marketing Plan *(Dr. Jace Lux and Ms. Stacey Biggs)*
- Retention Initiatives *(Dr. Brian Meredith and Mr. Chris Jensen)*

SCIENTIFIC DATA ANALYTICS GRADUATE CERTIFICATE

REQUEST: Approval of a Graduate Certificate in Scientific Data Analytics through Ogden College of Science and Engineering.

FACTS: Technological advances have produced increasingly large datasets across a diverse range of scientific domains. Students in scientific disciplines need focused coursework in data analytics. This certificate will document that students have acquired this expertise.

The current salary for a data scientist ranges from $92,000 to $168,000 with an average salary of $128,000[1]. Data science job opportunities are found across the country in large coastal cities, such as San Francisco and New York, but also in found in Louisville (52), Nashville (134) and Franklin[1].

While data scientist is often the main descriptor of an advertised position, handling large datasets is frequently an inherent part of a research job with another primary focus. For example, a job advertisement for a Poultry Scientist in Louisville included "Must have statistical know-how necessary to analyze and interpret large data sets and make scientifically-grounded decision" in the job description.[2] An opportunity for a Systems Biologist at a Memphis hospital includes "develop approaches to big data analysis" in the job description. [2]

The proposed graduate certificate highlights existing discipline-specific coursework involving large datasets and combines them with foundational courses in Computer Science and Statistics. The result is a certificate that shows a student's acquisition of graduate-level data analytic skills within a scientific context.

[1] https://www.glassdoor.com/Salaries/data-scientist-salary-SRCH_KO0,14.htm retrieved December 5, 2017.

[2] https://www.monster.com/ retrieved December 5, 2017.

The graduate certificate requires a minimum of 12 credit hours, and includes the following courses:

Required Courses	**Credits**
CS 555 Data Science	3
STAT 549 Statistical Methods	3
Selected courses from discipline specific courses with large datasets, from the list provided in the curriculum proposal that follows	6
Total	**12**

BUDGETARY IMPLICATIONS:
Implementation date will be Fall 2018, with no additional resources required.

RECOMMENDATION & IMPLEMENTATION DATE:
President Timothy C. Caboni recommends approval of a Graduate Certificate in Scientific Data Analytics.

MOTION: Approval to establish a Graduate Certificate in Scientific Data Analytics.

Graduate Certificate Program in Scientific Data Analytics
Create New Certificate

College: Ogden College of Science and Engineering (OCSE)
Department: OCSE Interdisciplinary Program
Contact Person: Dr. Lance Hahn, lance.hahn@wku.edu, 270-745-6314

1. Identification of program:

1.1 **Program title**: Scientific Data Analytics

1.2 **Required hours**: 12

1.3 **Program Description**: Technological advances have produced increasingly large datasets across a diverse range of scientific domains including biology, psychological science, and geography. As a result, students in scientific disciplines need focused coursework in data analytics. This certificate will serve that need and document that students have acquired this expertise.

1.4 **Classification of Instructional Program Code** (CIP): 11.0401

1.5 **WKU Reference number**: 0496

1.6 **Implementation term**: 2018-2019

2. Curriculum:

Required Courses	**Course Titles**	**Credit Hours**
CS 555	Data Science	3
STAT 549	Statistical Methods[1]	3
Total Core		**6**
Select 6 hours from the Following discipline specific courses with large datasets[2]		
AGRI 491G	Data Analysis and Interpretation	3
AGRI 590	Experimental Design	3
BIOL 483C	Biometry	3
BIOL 582	Biometry	1-6
CS 443G	Database Management Systems	3
CS 543	Advanced Database Systems	3
CS 565	Data Mining Techniques and Tools	3
GEOS 520	Geoscience Statistical Methods	4
GEOS 523	Geoprocessing & GIS Applications	4

GEOS 575	GIS Analysis and Modeling	3
GEOS 576	GIS Programming	3
GEOS 577	Special Topics in Geographic Information Systems	3
GEOS 515	Remote Sensing Applications	4
GEOS 517	Spatial Databases	3
GEOS 590	Experimental Design and Data Analysis	3
GEOS 595	Geoscience Practicum	3-6
GEOS 599	Thesis Writing and Research	1-6
PHYS 475G	Topics/Physics	1-3
PHYS 599	Thesis Research / Writing	1-6
PHYS 675	Advanced Topics in Physics	1-3
PSYS 512	Analysis of Variance	3
PSYS 513	Correlation and Regression Analysis	3
PSYS 518	Statistics and Psychometric Theory	3
PSYS 590	Readings of Research Psychology	1-3
PSYS 599	Thesis Research/Writing	1-6
STAT 550	Statistical Methods II	3
TOTAL HOURS		**12**

[1] Or graduate statistics course from the discipline specific course list below.

[2] Required courses cannot satisfy this requirement. At least two additional courses; thesis or topic courses must involve large datasets.

3. **List the objectives of the proposed program. These objectives should deal with the specific institutional and societal needs that this program will address:** As our world has become highly interconnected, our decisions can be informed using large and diverse datasets. Society will benefit from well-informed decisions utilizing datasets that provide a nuanced, high-resolution characterization of the world. As an institution, it is important that WKU educate our graduate students on how to use these large datasets so that they can appropriately use them to advance science and engineering.

4. **Explain how the proposed program address the state's postsecondary education strategic agenda:** Current advances in high technology and scientific endeavors spur economic growth which is one of the priorities of Kentucky's Postsecondary Strategic Agenda.

   A second priority of the Strategic Agenda is to increase degree completion and guide graduates to a career path. The proposed certificate is, by design, providing training that is relevant to the student's stated educational goal. The certificate is not a stand-alone program, but an interdisciplinary certificate that allows a student to acquire big scientific data analytic skills that include discipline-specific training in how to apply these skills. By

allowing students to use relevant discipline-specific courses in the pursuit of this certificate, we provide a stepping stone towards degree completion and a career in the science or engineering field of their choosing with a relevant advanced analytic skills.

5. **Explain how the proposed program furthers the statewide implementation plan:** A theme of the statewide implementation plan is to have accountability and measures of progress in education. This certificate will serve as a marker of progress for a graduate student pursuing a master's degree in their discipline.

6. **Student Learning Outcomes (SLO)**:

    1. Write computer programs to utilize and analyze large datasets.
    2. Understand the statistical approaches taken when dealing with large sample sizes
    3. Understand the statistical approaches taken when dealing with multiple variables
    4. Combine domain expertise with programming and statistical skills to analyze large domain-specific datasets**.**

7. **Provide evidence of student demand at the regional, state, and national levels:** The ability to properly manage large datasets and make appropriate inferences based on large datasets have been skills of increasing importance in any workplace that includes the internet. Within the last few years, there has been a growing realization that large datasets are relevant for a broad range of scientific endeavors.

    Current and potential students have indicated an interest in acquiring these skills to members of the OCSE committee that developed this proposal. As specific examples, Kevin Cary (Geography and Geology) has spoken with potential students in Geographic Information Systems (GIS) who are interested in acquiring these skill and Lance Hahn (Psychological Sciences) is currently teaching a special topics course in which he is teaching existing Psychological Sciences students how to write programs that may be used to manipulate large datasets.

    With data science jobs being one of the top employment opportunities, it is clear that there is a national need for graduates with these skills. Attractive salaries and job opportunities will certainly attract students and drive demand for these skills for fields within OCSE.

8. **Please identify similar programs in other SREB states and in the nation:**

    University of Louisville offers a graduate certificate in Data Mining. It is an 18-hour curriculum that is offered by the Computer Engineering and Computer Science department.

    Appalachian State University offers a graduate certificate in Business Analytics. It is a 15-hour curriculum with a business context.

University of Southern Mississippi offers an undergraduate certificate in Geographic Information Technology. It requires 6 hours of undergraduate coursework.

Central Michigan University offers a graduate certificate in data mining. The curriculum includes 15-18 credit hours. Computer programing, statistics and Geographic Information Systems are all included.

University of North Carolina at Greensboro offers a graduate certificate in Business Analytics. It requires 15 credit hours with at least 12 credits being in a business context.

University of North Carolina at Greensboro offers a graduate certificate in Business Analytics. It requires 12-15 credit hours that include web programming and telecommunications.

9. Provide a brief summary of resources that will be needed to implement this program over the next five years: No additional recourse required.

10. Dates of committee approvals:

Committee	Approval Dates
Ogden College of Science and Engineering	9/22/2017
Graduate Curriculum Committee	10/4/2017
Graduate Council	10/12/2017
University Senate	11/16/2017
Provost	11/20/2017
Board of Regents	

SABBATICAL LEAVES

REQUEST:
Approval of sabbatical leaves for faculty listed below.

FACTS:
Listed below are faculty members who have been recommended for sabbatical leave by the department head, College Sabbatical Advisory Committee, college dean, the Provost and President. They have served the university for at least six continuous full academic years, hold the rank of assistant professor or above, and have submitted a compelling sabbatical application for the purpose of professional academic enrichment.

College of Health and Human Services

Name	Department	Period of Leave
Dr. Dana Sullivan	Social Work	Fall 2018

Ogden College of Science and Engineering

Name	Department	Period of Leave
Dr. Amy Brausch	Psychological Sciences	Fall 2018
Dr. Xingang Fan	Geography & Geology	Fall 2018
Dr. Margaret Gripshover	Geography & Geology	Fall 2018
Dr. Matthew Shake	Psychological Sciences	Fall 2018

Potter College of Arts and Letters

Name	Department	Period of Leave
Dr. Audrey Anton	Philosophy & Religion	AY 2018-2019
Dr. Nicole Breazeale	Sociology	Fall 2018
Mr. Brent Dedas	Art	Fall 2018
Dr. Robert Dietle	History	Fall 2018
Dr. Eric Kondratieff	History	Fall 2018
Dr. Angela Jones	English	Fall 2018
Dr. Deborah Logan	English	Fall 2018
Dr. Donielle Lovell	Sociology	Fall 2018
Dr. Ke Peng	Modern Languages	Spring 2019
Dr. Inmaculada Pertusa	Modern Languages	Spring 2019

BUDGETARY IMPLICATIONS:
No additional resources are necessary to accommodate the sabbatical leaves. Courses usually taught by these faculty have been reassigned to other faculty members by each respective department head.

RECOMMENDATION:

President Timothy C. Caboni recommends awarding the above individuals sabbatical leave for the terms indicated.

MOTION:

Approval of faculty sabbatical leaves for the above recommended individuals.

EMERITUS APPOINTMENT

REQUEST:
Approval of faculty emeritus status for Dr. Steven Haggbloom.

FACTS:
Dr. Steven Haggbloom is a faculty member who has been recommended by the tenured faculty, department head, and college dean to be awarded emeritus status. Dr. Haggbloom has served the university for at least ten years with a distinguished record of achievement and service.

Ogden College of Science and Engineering

Dr. Steven Haggbloom, Professor of Psychological Sciences, Emeritus

BUDGETARY IMPLICATIONS:
No funds requested

RECOMMENDATION:
President Timothy C. Caboni recommends awarding Dr. Steven Haggbloom emeritus status.

MOTION:
Approval of emeritus status awarded for Dr. Steven Haggbloom.