

Ogden College of Science and Engineering
Western Kentucky University
Office of the Dean
745-6371

REPORT TO THE GRADUATE COUNCIL CURRICULUM COMMITTEE

DATE: September 6, 2017
FROM: Ogden College of Science and Engineering

Ogden College of Science and Engineering Committee Members: Dr. Becky Gilfillen, Dr. Michael Smith, Dr. Eric Conte, Dr. Royhan Gani, Dr. Dominic Lanphier, Dr. Sanju Gupta, Dr. Sharon Mutter, Dr. John Khouryieh

Chair: Dr. Cathleen Webb

The Ogden College of Science and Engineering submits the following item for consideration at the October Meeting.

Action	Proposal to Create a New Certificate Program Scientific Data Analysis Contact Person: Lance Hahn, lance.hahn@wku.edu , 5-6324
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MINUTES – OCSE Graduate Curriculum Committee

March 8, 2017

Members Present: Dr. Fred DeGraves, Dr. John Khouryieh, Dr. Eric Conte, Dr. Mustafa Atici, Dr. Shane Palmquist, Dr. David Keeling, Dr. Sanju Gupta, Dr. Sharon Mutter

Dr. Cathleen Webb, Chair

Guests: Toni Dye, Assistant Director of ISO

Nick Haught, Assistant Director, Pathway Relations – WKU Pathways

OLD BUSINESS

Keeling/Smith made a motion to approve the minutes from December and February. Approved unanimously.

NEW BUSINESS

Consent Item

Keeling/Gupta made a motion to bundle and approve the consent items. Approved unanimously.

Action Agenda

Keeling/Khouryieh made a motion to bundle and approve the action items (listed below). Approved unanimously.

Proposal to Revise a Course AGRO 452G, Soil Microbiology

Proposal to Revise a Course AGRO 454G, Soil Management and Conservation

Keeling/Atici made a motion to bundle and approve the action items (listed below). Approved unanimously.

Proposal to Revise a Program Ref: 072, Geoscience

Keeling/Khouryieh made a motion to bundle and approve the action items (listed below). Approved unanimously.

Proposal to Revise a Course GEOS 523, Urban GIS Applications

Proposal to Revise a Course GEOS 534, Historic Preservation Planning

Proposal to Revise a Course 580, Seminar Urban Geography

Keeling/Palmquist made a motion to bundle and approve the action items (listed below). Approved unanimously.

Proposal to Create a New Course CS 535, Cloud Computing

MINUTES – OCSE Graduate Curriculum Committee

April 12, 2017

Members Present: Dr. Fred DeGraves, Dr. John Khouryieh, Dr. Eric Conte, Dr. Shane Palmquist, Dr. David Keeling, Dr. Sanju Gupta, Dr. Sharon Mutter

Dr. Cathleen Webb, Chair

OLD BUSINESS

Keeling/Gupta made a motion to approve the minutes from March with some friendly amendments. Approved

NEW BUSINESS

Action Agenda

Keeling/Gupta made a motion to approve the action items (listed below) with friendly amendments. Approved.

- Proposal to Revise a Course AGRO 409G, Weed Science
- Proposal to Revise a Course AGRO 410G, Weed Science Laboratory
- Proposal to Revise a Program Ref. 052, Master of Science in Agriculture
- Proposal to Create a New Program, Graduate Certificate in Biology
- Proposal to Revise a Program, Ref. 0442, Biology Education for Teacher Leaders, Master of Arts Education
- Proposal to Revise a Program, Ref. 059, Chemistry, Master of Science

Certificate Program - Create New
(Action)

Date:

College: Ogden College of Science & Engineering

Department: Ogden College of Science & Engineering

Contact Person: 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 Hours
- 1.3 Program Description:
Technological advances across many science disciplines are producing copious amounts of data. The certificate in Scientific Data Analytics will provide both the foundational and discipline-specific curriculum for students within Ogden College of Science & Engineering to acquire the skills necessary to appropriately analyze large datasets in their field.
- 1.4 Classification of Instructional Program Code (CIP): 11.0401

2. Learning outcomes of the proposed certificate program:

- Students will be able to:
 - Write computer programs to utilize and analyze large datasets.
 - Understand the statistical approaches taken when dealing with large sample sizes.
 - Understand the statistical approaches taken when dealing with multiple variables.
 - Combine domain expertise with programming and statistical skills to analyze large domain-specific datasets.

3. Rationale:

- 3.1 Reason for developing the proposed certificate program:
 - 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 the scientific disciplines within OCSE need focused coursework in data analytics. This certificate will serve that need and document that these students have acquired this expertise.
- 3.2 Relationship of the proposed certificate program to other programs now offered by the department:
 - A certificate in Geographic Information Science is offered by the Department of Geography and Geology. While this certificate does include coursework that uses large datasets, its scope is naturally limited to GIS.
- 3.3 Relationship of the proposed certificate program to certificate programs offered in other departments:
 - An undergraduate certificate in Applied Data Analytics is offered by the Gordon Ford College of Business. Unlike the proposed certificate, this certificate is focused on analyzing data within a business setting and is offered at the undergraduate level.
 - A graduate certificate in Measurement, Evaluation, and Research is offered by the department of Educational Administration, Leadership,

and Research. Unlike the proposed certificate, this certificate is not focused on large datasets and is specifically focused on education.

- 3.4 Projected enrollment in the proposed certificate program:
- 5 students per year.
- 3.5 Similar certificate programs offered elsewhere in Kentucky and in other states (including programs at benchmark institutions):
- 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 programming, 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.
- 3.6 Relationship of the proposed certificate program to the university mission and objectives:
- The proposed graduate certificate will prepare students studying in a scientific discipline to use large datasets. Such preparation is essential for disciplines in which technology is generating extremely large datasets. This knowledge and skill set will help our students be more successful in the academic and nonacademic workplaces.

4. **Admission Criteria:**

Admission to the Graduate School

5. **Curriculum:**

Required Course in Computer Programming:

CS 555 Data Science	3 credit hours
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Required Course in Statistics:

STAT 549 Statistical Methods I	3 credit hours
or a graduate-level statistics course from the discipline-specific course list.	

Discipline-Specific Courses with Large Datasets:	6 credit hours
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At least two additional courses; thesis or topic courses *must* involve large datasets

BIOL 483G Multivariate Methods in Biology
BIOL 582 Biometry
BIOL 599 Thesis

CIT 452G. Advanced Database Administration I
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CIT 454G. Advanced Database Administration II

CS 443G Database Management Systems
CS 543 Advanced Database Systems4
CS 555 Introduction To Data Science
CS 565 Data Mining

GEOS 520 Geoscience Statistical Methods
GEOS 523 Urban GIS Applications
GEOS 575 GIS Modeling and Analysis
GEOS 576 GIS Programming
GEOS 577 Special Topics in GIS
GEOS 515 Remote Sensing
GEOS 517 Advanced Spatial Databases
GEOS 590 Experimental GIS Design
GEOS 595 Supervised GIS Practicum

PHYS 475G Topics in Physics (1-3 credit hours)
PHYS 599 Thesis Research / Writing (1-6 credit hours)
PHYS 675 Advanced Topics in Physics (1-3 credit hours)

PSYS 512 Analysis of Variance
PSYS 513 Correlation and Regression Analysis
PSYS 518 Statistics and Psychometric Theory
PSYS 590 Readings of Research Psychology
PSYS 599 Thesis Research and Writing

STAT 549 Statistical Methods I
STAT 550 Statistical Methods II

Total 12 credit hours

6. Budget implications:

The proposed certificate is based on pre-existing courses. Current staffing is sufficient.

7. Term of implementation: Spring 2018

8. Dates of committee approvals:

College Curriculum Committee	_____
Graduate Council Curriculum Committee	_____
Graduate Council	_____
University Senate	_____
Board of Regents	_____

- OCSE Graduate Student Representative for Graduate Council
- 4XX and co-convened classes 4XXG/5XX and SACS considerations for syllabi
- Should a JUMP or a BS graduate from our UG program who took a 4XX now (as a graduate student) take the co-convened class? SACS considerations.

SEAS nominates Mercy Ebuetsse for OCSE Grad Student Representative for WKU Graduate Council. Her resume is attached.

Mercy Ebuetsse is a second-year graduate student of Engineering Technology Management at Western Kentucky University. Mercy holds a Bachelor's degree in Civil Engineering from Covenant University. She has interests in research, technology, and management as a tool for societal development. She has co-authored a research paper titled, "Drinking Water Quality and Sanitation Issues: A Survey of a Semi-Urban Setting in Nigeria" with the intent of improving the quality of life of people in Urban Communities. She is a recipient of the Robert J. Wurster and Montgomery, Lois G. & F. Dugan Scholarship awards. Mercy has also served as a volunteer with many organizations including Hope Foundation and PYP where she offered her time teaching and mentoring teenagers. She is currently an ambassador for Reach Out (ROI) Africa.

John

Mercy Ebuete
103 Old Morgantown Road,
Bowling Green, Kentucky 42101

Phone: 812-560-2191
Email: mercyaakunna.ebuete142@topper.wku.edu

Education

Western Kentucky University (WKU) Masters of Science in Engineering Technology Management; GPA: 4.0/4.0	Bowling Green, KY, USA Aug 2016 – May 2018 (expected)
Covenant University Bachelor of Engineering in Civil Engineering; GPA: 3.33/5.0	Ota, Nigeria Sep 2008 - June 2013

Skills and Relevant Coursework

Skills: AUTOCAD (Intermediate level), Microsoft Office

Relevant Coursework: Research Methods, Quality Management, Product Development, Lean Systems, Resource Management, Project Management, Supply Chain Management, Emerging Technology, Operations Leadership

Work Experience

WKU Architectural & Manufacturing Sciences Department <i>Graduate Research Assistant</i>	Bowling Green, KY, USA Aug 2017 - Present
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- Working with graduate faculty on research projects

Shalom Truths Global Communication <i>Founder and Chief Executive</i>	Lagos, Nigeria May 2014 - Present
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- Generated seed investment from investments totaling \$15,000 to launch the business
- Responsible for day-to-day management and leadership decision making for over 10 freelance writers/employees
- Content curation and editing to ensure the company's social media site is active, in order to increase site statistics

Ministry of Works and Transport <i>Civil Engineer</i>	Benue, Nigeria Dec 2013 - Oct 2014
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- Supervised a team of about 30 employees on a dual road construction project
- Participated in the team project that surveyed the scheduled road for rehabilitation
- Involved in planning of a dual road construction project

Salvage Engineering <i>Civil Engineering Intern</i>	Lagos, Nigeria Aug 2012 - Sep 2012
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- Conducted inspection on various construction projects including home and road development
- Participated in carrying out "in-situ tests" (Cone penetration test and Standard penetration test) at various sites
- Supervised the construction of a twin duplex in a major sub-development area

Julius Berger (Highway Engineering) <i>Supply Chain Intern</i>	Lagos, Nigeria March 2012 - July 2012
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- Prepared bill of materials used in procurement of construction materials needed for a major road construction
- Utilized MS Excel to calculate the quantity of materials used on the construction project and their prices
- Inspected project on a bi-weekly basis to determine its progress and analyze areas for improvement

AWARDS & SCHOLARSHIPS

- Montgomery, Lois G. & F. Dugan Scholarship (2017-2018)
- Robert J. Wurster Scholarship (2017-2018)
- Best Wing Representative, Covenant University (2009)

ACCOMPLISHMENTS

- Co-Authored a research paper titled "Drinking Water Quality and Sanitation Issues: A Survey of a Semi-Urban Setting in Nigeria" in International Journal of Research in Engineering and science (IJRES) Volume 2, Issue 11.
- Recognized by the Social Impact team from the University of Pennsylvania's Wharton School of Business as an aspiring "Forbes under 30" Entrepreneur.

EXTRACURRICULAR ACTIVITIES

- National Society of Black Engineers
- Society of Women Engineers