## MEMORANDUM TO: Ogden College of Science and Engineering Curriculum Committee

Dr. Martin Stone

Dr. Warren Campbell

Dr. Doug Chelson

Dr. Xingang Fan

Dr. Phil Lienesch

Dr. Nguyen Ngoc

Dr. Darwin Dahl

Dr. Doug Harper

Dr. Huanjing Wang

Dr. Andy Mienaltowski

Dr. Les Pesterfield

FROM: Dr. Kenneth Crawford, Chair

SUBJECT: Agenda for Thursday, September 1, 2016, 4:00p.m. in COHH 4123

#### A. OLD BUSINESS:

I. Consideration of the minutes of the May 5, 2016 Meeting

## B. NEW BUSINESS:

### Consent Items

#### Department of Chemistry

- I. Proposal to Revise Course Prerequisites
  - a. CHEM 304, Biochemistry for the Health Sciences, 4 hrs.

## Department of Geography & Geology

- I. Proposal to Revise Course Prerequisites
  - a. GEOG 391, Spatial Date Analysis, 4 hrs.
  - b. GISC 316, Fundamentals of GIS, 4hrs.
  - c. WTTI 1715, Certificate in Drinking Water Operations, 24 hrs.

### Action Items

#### Department of Geography & Geology

- I. Proposal to Create a New Course
  - a. METR 460, Climate Teleconnictions, 3 hrs.
- II. Proposal to Revise a Program
  - a. Ref. 675, Geography and Environmental Studies, 52 hrs.

b.

#### Department of Psychological Sciences

- 1. Proposal to Create a New Course
  - a. PSYS 361, Behavioral Neuroscience with Lab, 4 hrs.

#### **SKyTeach**

- I. Proposal to Revise a Program
  - a. Ref. 734, Middle School Science, 47 hrs.

Proposal Date: 05/11/16

## Ogden College of Science & Engineering Department of Chemistry Proposal to Revise Course Prerequisites/Corequisites (Consent Item)

Contact Person: Dr. Jeremy B Maddox, Jeremy.maddox@wku.edu, (270) 745-8725

1.	Identificat	ion of course:	
		urse prefix (subject area) and number: CHEM in urse title: BIOCHEMISTRY FOR THE HEAL	
2.	Current pi	rerequisites/corequisites/special requirements	s:
	Prerequisite	e: CHEM 109 or consent of the instructor.	
3.	Proposed p	orerequisites/corequisites/special requiremen	ts:
	Prerequisite	e: CHEM 107 or CHEM 109.	
4.	Rationale f	for the revision of prerequisites/corequisites/s	special requirements:
		ed revisions will allow nutrition and pre-dental for CHEM 304 without the need for a prerequisi	
5.	Effect on co	ompletion of major/minor sequence:	
	Not applical	ble	
6.	Proposed to	erm for implementation:	
	Spring 2017	7	
7.	Dates of pri	ior committee approvals:	
	Department	of Chemistry	May 11, 2016
	Ogden Colle	ege Curriculum Committee	
	Undergradua	ate Curriculum Committee	
	University S	Senate	production and the second seco

# Ogden College of Science and Engineering Department of Geography & Geology Proposal to Revise Course Prerequisites/Corequisites (Consent Item)

Contact Person: Kevin Cary, kevin.cary@wku.edu, 745-2981

1.	Identification of course:  1.1 Course prefix (subject area) and number: GEOG 391 1.2 Course title: Spatial Data Analysis 1.3 Credit hours: 4		
2.	Current prerequisites requirements: MATH 183 and GISe by instructor.	C 316, or special permission	
3.	<b>Proposed prerequisites requirements:</b> MATH 183 or MA's special permission by instructor.	<b>TH 136,</b> and GISC 316; or	
4.	Rationale for the revision of prerequisites: Students completing either MATH 183 ( <i>Introductory Statistics</i> ) OR MATH 136 ( <i>Calculus I</i> ) should have the necessary math skills needed to succeed in GEOG 391 ( <i>Spatial Data Analysis</i> ).		
5.	Effect on completion of major/minor sequence: No change. GEOG 391 is required for Geography, Meteorology, and GIScience majors. MATH 183 is required for Geography and GIScience majors. MATH 136 is required for Meteorology majors. GEOG 391 is an elective in the Geography minor and not required for the GIS minor.		
6.	Proposed term for implementation: Fall 2017		
7.	Dates of prior committee approvals:		
	Department/Division:	May 6, 2016	
	Ogden Curriculum Committee		
	Undergraduate Curriculum Committee		
	University Senate		

## Ogden College of Science and Engineering Department of Geography & Geology Proposal to Revise Course Prerequisites (Consent Item)

Contact Person: Kevin B. Cary, M.Sc., GISP e-mail: kevin.cary@wku.edu Phone: 5-2981

1.	Identification of course:  1.1 Course prefix (subject area) and number: GISC 316 1.2 Course title: Fundamentals of GIS 1.3 Credit hours: 4
2.	Current prerequisites requirements: GEOG 103, OR GEOL 103, AND GEOG 110, or permission of the instructor.
3.	Proposed prerequisites/corequisites requirements: GEOG/GEOL 103 OR GEOL 111 OR METR 121; and GEOG 110; or permission by instructor.
4.	Rationale for the revision of prerequisites/corequisites/special requirements: Adding METR 121 provides greater flexibility for Meteorology majors, and adding GEOL 111 provides greater flexibility for Geology majors, as both groups are required to take GISC 316.
5.	<b>Effect on completion of major/minor sequence:</b> No change. GISC 316 is required for all majors in the Department.
6.	Proposed term for implementation: Spring 2017
7.	Dates of prior committee approvals:
	Department of Geography and Geology:May 6, 2016
	Ogden Curriculum Committee
	Undergraduate Curriculum Committee
	University Senate

Proposal Date: 3/4/2016

## Ogden College Department of Geography and Geology Proposal to Delete a Program (Consent Item)

Contact Person: Jason Polk, jason.polk@wku.edu, 270-745-5015

University Senate

1.	Identi 1.1 1.2 1.3	fication of program: Program reference number: 1715 Program title: Certificate in Drinking Water Oper Credit hours: 24	ations
2.	grant t progra Drinki offered serving studen mainta	hat established an online A.S. degree for water open means deleted in Fall 2015. As part of that program means are water open means deleted in Fall 2015. As part of that program means are water operations certificate program relied upon the contract of the primary instructors in the past. Enrollment the program is not sustainable, nor is the ining this program within a baccalaureate-offering ary resources to administer the program, or a demandation of the program of the program, or a demandation of the program of the program, or a demandation of the program of the program, or a demandation of the program of the program, or a demandation of the program of the program, or a demandation of the program of	erators. The grant ended and the m's course sequence, the on courses that are no long t teach the courses, with adjuncts in the courses is often 0-<5 Department interested in framework without the
3.	There s	on current students or other departments, if kn should be no effect on other departments or degree ts enrolled in this program.	
4.	Propos	sed term for implementation: Fall 2016	
5.	Dates	of prior committee approvals:	
	Departr	ment of Geography and Geology	2/26/2016
	Ogden	College Curriculum Committee	
	Univers	sity Curriculum Committee	

Proposal Date: 3/17/16

## Ogden College of Science and Engineering Department of Geography and Geology Proposal to Create a New Course (Action Item)

Contact Person: Greg Goodrich, gregory.goodrich@wku.edu, 5-5986

#### 1. Identification of proposed course:

- 1.1 Course prefix (subject area) and number: METR 460
- 1.2 Course title: Climate Teleconnections
- 1.3 Abbreviated course title: Climate Teleconnections
- 1.4 Credit hours: 3

Variable credit (no)

- 1.5 Grade type: Standard letter grade
- 1.6 Prerequisites: METR 322 OR METR 324 OR permission of instructor
- 1.7 Course description: Analysis of the climate impacts and physical mechanisms of atmospheric and oceanic teleconnections that commonly affect weather patterns in the northern hemisphere.

#### 2. Rationale:

- 2.1 Reason for developing the proposed course: Climate teleconnections, which include the well-known El Niño - Southern Oscillation, represent low-frequency variability in the atmosphere and oceans. They can have periods ranging from several weeks to several decades and can affect temperature, precipitation, storm tracks, severe weather, and drought, primarily in the northern hemisphere. Extreme weather is often influenced by teleconnection patterns that cause persistent weather in various locations and recent evidence suggests that many of these teleconnections will be influenced by climate change. Since nearly all longrange forecasting of weather and climate uses teleconnections, there is growing recognition that students in meteorology, geography, climatology, and other disciplines that use climate data need a strong background in climate teleconnections. A GEOG 475/GEOS 510 research course titled "Climate Teleconnections" was offered on a one-time basis in Spring 2015. The demand (13 undergrad/2 graduate) was strong enough to encourage the creation of a permanent course offered once every two years.
- 2.2 Projected enrollment in the proposed course: 10-15 junior/senior-level students offered once every two years with an occasional graduate student.
- 2.3 Relationship of the proposed course to courses now offered by the department:

  METR 322 "Global Climate Systems", which will serve as a prerequisite for
  the class, is a broad climatology course that spends only a couple of lectures
  introducing how teleconnections are part of the global climate system. METR
  422 "Physical Climatology" covers key processes governing the energy balance
  of the atmospheric boundary layer. Neither course provides the in-depth analysis
  of the climate impacts and physical mechanisms behind the climate
  teleconnections that control northern hemisphere climate.

- 2.4 Relationship of the proposed course to courses offered in other departments: No other department offers a course similar to this subject.
- 2.5 Relationship of the proposed course to courses offered in other institutions: The University of Florida offers a 400-level course titled "Atmospheric Teleconnections" that served as a model for the proposed course. Several institutions, including the University of Washington and Colorado State University offer graduate seminars on the subject.

#### 3. Discussion of proposed course:

- 3.1 Schedule type: L Lecture
- 3.2 Learning Outcomes: Students will demonstrate the ability to:
  - 1) Explain the history of how each teleconnection was discovered.
  - 2) Explain how the index of each teleconnection is derived.
  - 3) Discuss the climate impacts and timescales associated with each teleconnection.
  - 4) Describe the physical mechanisms that force each teleconnection.

#### 3.3 Content outline:

#### Tentative course outline

- Winter forecasts example of how teleconnections are used
- Overview of atmospheric circulation
- Statistics review/correlation/linear regression/principal components analysis
- History of teleconnections
- Oceanic teleconnections
  - o El Niño Southern Oscillation (ENSO)
  - o Pacific Decadal Oscillation (PDO)
  - o Atlantic Multi-decadal Oscillation (AMO)
- What can paleoclimatology tell us about teleconnections?
- Atmospheric teleconnections
  - o North Atlantic Oscillation (NAO)
  - o Arctic Oscillation (AO)/Northern Annular Mode
  - o Pacific/North American pattern (PNA)
  - o Madden-Julian Oscillation (MJO)
  - o Antarctic Oscillation (AAO)/Southern Annular Mode
  - o Quasi-Biennial Oscillation (QBO) and other lesser known teleconnection
    - East Atlantic Jet (EA)
    - West Pacific Jet (WP)
    - Tropical/Northern Hemisphere pattern (TNH)
    - Eurasian patterns (SCAND, POL, EATL/WRUS)
    - East Pacific Oscillation (EPO)
- Snow cover as a teleconnection
- Long range forecasting techniques
- How will teleconnections change in a warming world?
  - 3.4 Student expectations and requirements:
    - Two mid-term quizzes (50%), one research project (30%), and two in-class discussions (20%) will comprise the grade for this course.

- 3.5 Tentative texts and course materials:
  - Glantz, M. H., R. W. Katz, and N. Nicholls (eds.), 2009: *Teleconnections linking worldwide climate anomalies*. Cambridge University Press, Cambridge, UK, 548 pages
  - Bridgman, H. A., and J. E. Oliver (eds.), 2014: *The global climate system:*Patterns, processes, and teleconnections. Cambridge University
    Press, Cambridge, UK, 358 pages

Most of the course content will come from a 100-article annotated bibliography on the subject of climate teleconnections I recently submitted for publication.

- 4. Resources:
  - 4.1 Library resources: See attached
  - 4.2 Computer resources: None
- 5. Budget implications:
  - 5.1 Proposed method of staffing: Existing faculty
  - 5.2 Special equipment needed: None
  - 5.3 Expendable materials needed: None
  - 5.4 Laboratory materials needed: None
- 6. Proposed term for implementation: Spring 2017
- 7. Dates of prior committee approvals:

Department of Geography and Geology	March 25, 2016
Ogden College Curriculum Committee	
University Curriculum Committee	
University Senate	8

Proposal Date: August 17, 2016

## Ogden College of Science and Engineering Department of Geography and Geology Proposal to Revise a Program (Action Item)

Contact Person: David Keeling, david.keeling@wku.edu, 5-4555

## 1. Identification of program:

- 1.1 Current program reference number: 675
- 1.2 Current program title: Geography and Environmental Studies
- 1.3 Credit hours: 52

## 2. Identification of the proposed program changes:

2.1 Add MATH 115 as an option to required supporting courses.

3. Detailed program description:

3. Detailed program description:			
Karst and Water Resources Concentration		Karst and Water Resources Concentration	
Common Core Requirements (26 hours):		Common Core Requirements (26 hours):	
GEOG or GEOL 103 Our Dynamic Earth	3	GEOG or GEOL 103 Our Dynamic Earth	3
GEOG 110 World Regional Geography	3	GEOG 110 World Regional Geography	3
GEOG 300 Writing in the Geosciences	3	GEOG 300 Writing in the Geosciences	3
GISC 316 Fundamentals of GIS	4	GISC 316 Fundamentals of GIS	4
GISC 317 GIS	4	GISC 317 GIS	4
GEOG 391 Spatial Data Analysis	4	GEOG 391 Spatial Data Analysis	4
GEOG 495 Research Practicum/Internship		GEOG 495 Research Practicum/Internship	
OR		OR	
GEOG 452 Applied Geo Field Experiences		GEOG 452 Applied Geo Field Experiences	
OR		OR	
GEOG 475 Selected Topics in Geography	4	GEOG 475 Selected Topics in Geography	4
GEOG 499 Professional Development	1	GEOG 499 Professional Development	1
Required Concentration Courses: (13 hours)	:	Required Concentration Courses: (13 hours):	
GEOG 280 Environmental Science and		GEOG 280 Environmental Science and	
Sustainability	4	Sustainability	4
GEOG or GEOL 310 Global Hydrology	3	GEOG or GEOL 310 Global Hydrology	3
GEOG 461 Karst Environments	3	GEOG 461 Karst Environments	3
GEOG 475 Mammoth Cave Field Course	3	GEOG 475 Mammoth Cave Field Course	3
			1
Elective Courses: (13 hours):		Elective Courses: (13 hours):	
Select from any appropriate GEOG, GISC,		Select from any appropriate GEOG, GISC,	
GEOL, or METR 2xx-4xx course with your	.	GEOL, or METR 2xx-4xx course with your	
advisor (examples include 226, 322, 328 344	١,	advisor (examples include 226, 322, 328 344	,
414, 459, 471, 474, 487, etc.) to meet the 52		414, 459, 471, 474, 487, etc.) to meet the 52	

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unduplicated hours required.	unduplicated hours required.
Additional Program Requirements (not included in the 52-hour program) (13-14 hours):  •MATH 136 Calculus 1  •MATH 183 (Prerequisite for GEOG 391) 3  •PHYS 201 College Physics I 4 or BIOL 122 Biological Concepts 3  •CHEM 120 College Chemistry I 3	Additional Program Requirements (not included in the 52-hour program) (13-14 hours):  •MATH 136 Calculus 1  •MATH 183 (Prerequisite for GEOG 391)  •PHYS 201 College Physics I  or BIOL 122 Biological Concepts  •CHEM 120 College Chemistry I  3
Climate Systems Concentration	Climate Systems Concentration
Common Core Requirements (26 hours): GEOG or GEOL 103 Our Dynamic Earth GEOG 110 World Regional Geography GEOG 300 Writing in the Geosciences GISC 316 Fundamentals of GIS GISC 317 GIS GEOG 391 Spatial Data Analysis GEOG 495 Research Practicum/Internship OR GEOG 452 Applied Geo Field Experiences OR Advisor Approved Field-based GEOG 475  GEOG 499 Professional Development  Required Concentration Courses (10 hours): METR 121 Meteorology METR 322 Global Climate Systems GEOG 455 Global Climate Change	Common Core Requirements (26 hours): GEOG or GEOL 103 Our Dynamic Earth GEOG 110 World Regional Geography GEOG 300 Writing in the Geosciences GISC 316 Fundamentals of GIS GISC 317 GIS GEOG 391 Spatial Data Analysis GEOG 495 Research Practicum/Internship OR GEOG 452 Applied Geo Field Experiences OR Advisor Approved Field-based GEOG 475  GEOG 499 Professional Development  Required Concentration Courses (10 hours): METR 121 Meteorology METR 322 Global Climate Systems GEOG 455 Global Climate Change  3
Elective Courses (16 hours): Select from any appropriate GEOG, GISC, or METR 2xx-4xx course with your advisor (examples include 121, 226, 322, 328. 344, 414, 459, 471, 474, 487, etc.) to meet the 52 unduplicated hours required. At least 26 hours in the program must be at the upper division level.  Additional Program Requirements (not included in the 52-hour program) (6 hours):	Elective Courses (16 hours): Select from any appropriate GEOG, GISC, or METR 2xx-4xx course with your advisor (examples include 121, 226, 322, 328. 344, 414, 459, 471, 474, 487, etc.) to meet the 52 unduplicated hours required. At least 26 hours in the program must be at the upper division level.  Additional Program Requirements (not included in the 52-hour program) (6 hours):

• MATH 116 Algebra	3	• MATH 115 OR 116 Algebra	3
MATH 183 Statistics	3	• MATH 183 Statistics	3
Tourism and Development Concentration		Tourism and Development Concentration	
Common Core Requirements (26 hours):		Common Core Requirements (26 hours):	
GEOG or GEOL 103 Our Dynamic Earth	3	GEOG or GEOL 103 Our Dynamic Earth	3
GEOG 110 World Regional Geography	3	GEOG 110 World Regional Geography	3
GEOG 300 Writing in the Geosciences	3	GEOG 300 Writing in the Geosciences	3
GISC 316 Fundamentals of GIS	4	GISC 316 Fundamentals of GIS	4
GISC 317 GIS	4	GISC 317 GIS	4
GEOG 391 Spatial Data Analysis	4	GEOG 391 Spatial Data Analysis	4
GEOG 495 Research Practicum/Internship		GEOG 495 Research Practicum/Internship	
OR		OR	
GEOG 452 Applied Geo Field Experiences OR		GEOG 452 Applied Geo Field Experiences OR	
GEOG 475 Selected Topics in Geography	4	GEOG 475 Selected Topics in Geography	4
GEOG 499 Professional Development	1	GEOG 479 Selected Topics in Geography GEOG 499 Professional Development	1
dEOG 479 I folessional Development	1	GEOG 477 I fotossional Development	1
Required Concentration Courses: (6 hours):		Required Concentration Courses: (6 hours):	
GEOG 330 Intro to Cultural Geography	3	GEOG 330 Intro to Cultural Geography	3
GEOG 481 Tourism Geography	3	GEOG 481 Tourism Geography	3
oboo (or rounding oroginal)	Ü	0200 (01 1000000 01000000000000000000000	-
Elective Courses (20 hours):		Elective Courses (20 hours):	
Select from any appropriate GEOG, GISC, o	r	Select from any appropriate GEOG, GISC, o	or
METR 2xx-4xx course with your advisor		METR 2xx-4xx course with your advisor	
(examples include 200, 210, 226, 280, 344,		(examples include 200, 210, 226, 280, 344,	
350, 352, 385, 471, 474, 487, etc.) to meet th	e	350, 352, 385, 471, 474, 487, etc.) to meet th	ne
52 unduplicated hours required.		52 unduplicated hours required.	
Additional Duraness Demoissance (ast		Additional Duraman Danvinson outs (not	
Additional Program Requirements (not		Additional Program Requirements (not included in the 52-hour program) (6 hours):	
included in the 52-hour program) (6 hours): • MATH-116-Algebra	3	• MATH 115 OR 116 Algebra	3
• MATH 183 Statistics	3	• MATH 113 OR 116 Algebra • MATH 183 Statistics	3
· WATTI 105 Statistics	5	VIVIATIT 103 Statistics	ر
Geography Concentration		Geography Concentration	
Common Core Requirements (26 hours):		Common Core Requirements (26 hours):	
GEOG or GEOL 103 Our Dynamic Earth	3	GEOG or GEOL 103 Our Dynamic Earth	3
GEOG 110 World Regional Geography	3	GEOG 110 World Regional Geography	3
GEOG 300 Writing in the Geosciences	3	GEOG 300 Writing in the Geosciences	3
GISC 316 Fundamentals of GIS	4	GISC 316 Fundamentals of GIS	4
GISC 317 GIS	4	GISC 317 GIS	4
GEOG 391 Spatial Data Analysis	4	GEOG 391 Spatial Data Analysis	4
GEOG 495 Research Practicum/Internship	1	GEOG 495 Research Practicum/Internship	1
OR		OR	

GEOG 452 Applied Geo Field Experiences OR GEOG 475 Selected Topics in Geography GEOG 499 Professional Development  1	GEOG 452 Applied Geo Field Experiences OR GEOG 475 Selected Topics in Geography GEOG 499 Professional Development 1
Required Concentration Courses: (6 hours): GEOG 330 Intro to Cultural Geography GEOG 430 Topics in Cultural Geography 3	Required Concentration Courses: (6 hours): GEOG 330 Intro to Cultural Geography 3 GEOG 430 Topics in Cultural Geography 3
Elective Courses (20 hours): Select from any appropriate GEOG, GISC, or METR 2xx-4xx course with your advisor (examples include 200, 210, 226, 280, 344, 350, 352, 385, 471, 474, 487, etc.) to meet the 52 unduplicated hours required.	Elective Courses (20 hours): Select from any appropriate GEOG, GISC, or METR 2xx-4xx course with your advisor (examples include 200, 210, 226, 280, 344, 350, 352, 385, 471, 474, 487, etc.) to meet the 52 unduplicated hours required.
Additional Program Requirements (not included in the 52-hour program) (6 hours):  • MATH 116 Algebra  • MATH 183 Statistics  3	Additional Program Requirements (not included in the 52-hour program) (6 hours):  • MATH 115 OR 116 Algebra  • MATH 183 Statistics  3
Environment and Sustainability Concentration	Environment and Sustainability Concentration
Common Core Requirements (26 hours): GEOG or GEOL 103 Our Dynamic Earth 3 GEOG 110 World Regional Geography 3 GEOG 300 Writing in the Geosciences 3 GISC 316 Fundamentals of GIS 4 GISC 317 GIS 4 GEOG 391 Spatial Data Analysis 4 GEOG 495 Research Practicum/Intern OR GEOG 452 Applied Geo Field Experiences	Common Core Requirements (26 hours): GEOG or GEOL 103 Our Dynamic Earth 3 GEOG 110 World Regional Geography 3 GEOG 300 Writing in the Geosciences 3 GISC 316 Fundamentals of GIS 4 GISC 317 GIS 4 GEOG 391 Spatial Data Analysis 4 GEOG 495 Research Practicum/Intern OR GEOG 452 Applied Geo Field Experiences
OR GEOG 475 Selected Topics in Geography 4	OR GEOG 475 Selected Topics in Geography 4
GEOG 499 Professional Development 1	GEOG 499 Professional Development 1
Required Concentration Courses (10 hrs): GEOG 210 Env and Ecological Policy 3 GEOG 280 Env Sci and Sustainability 4 GEOG 380 Global Sustainability 3 Elective Courses (16 hours): Select from any appropriate GEOG, GISC, or METR 2xx-4xx course with your advisor (examples include 121, 226, 322, 328 344, 414, 459, 471, 474, 487, etc.) to meet the 52	Required Concentration Courses (10 hrs): GEOG 210 Env and Ecological Policy 3 GEOG 280 Env Sci and Sustainability 4 GEOG 380 Global Sustainability 3 Elective Courses (16 hours): Select from any appropriate GEOG, GISC, or METR 2xx-4xx course with your advisor (examples include 121, 226, 322, 328 344, 414, 459, 471, 474, 487, etc.) to meet the 52

in the program must be at the upper division level.	in the program must be at the upper division level.		
Additional Program Requirements (not included in the 52-hour program) (6 hours):  • MATH 116 Algebra 3  • MATH 183 Statistics 3	Additional Program Requirements (not included in the 52-hour program) (6 hours):  • MATH 115 OR 116 Algebra  • MATH 183 Statistics		
	ge: ed for students who do not need to go on to MATH dested that this course be offered as an alternative to		
5. Proposed term for implementation: Spring	; 2017		
6. Dates of prior committee approvals:			
Department of Geography and Geology	08/17/2016		
Ogden College Curriculum Committee			
University Curriculum Committee			
University Senate			

Proposal Date: 8/18/2016

## Ogden College of Science and Engineering Department of Psychological Sciences Proposal to Create a New Course (Action Item)

Contact Person: Lance Hahn, lance.hahn@wku.edu, 5-6314

#### 1. Identification of proposed course:

- 1. Course prefix (subject area) and number: PSYS 361
- 2. Course title: Behavioral Neuroscience with Lab
- 3. Abbreviated course title: BEHAVIORAL NEURO WITH LAB (maximum of 30 characters or spaces)
- 4. Credit hours: 4

Variable credit: no

- 5. Grade type: letter grade
- 6. Prerequisites/corequisites: Major or minor in Psychological Sciences, or minor in Neuroscience; PSYS/PSY 210 and 211 with a grade of C or better, or permission of the instructor.
- 7. Course description: An examination of the neurological bases of major psychological constructs including lab-based activities such as dissections, physiological recordings and behavioral measures. Open only to psychological science minor/majors and Neuroscience minors. Only one of the two courses PSYS 360 and PSYS 361 can be counted towards the Psychological Science major or minor, or the Neuroscience minor. Course Fee.

#### 2. Rationale:

- 1. Reason for developing the proposed course:
  - Neuroscience continues to have a significant and increasing impact on psychology. Understanding how neuroscience contributes to our understanding of behavior is a key element of the science of psychology. While the lecture-based course communicates the course material, this lecture/lab hybrid provides our majors and minors with critical lab-based experiences. Within the field of behavioral neuroscience, understanding the limitations and benefits of lab-based hypothesis-testing is critical to both 1) identifying the appropriate empirical approach and 2) understanding and evaluating previously published results. The proposed course is a necessary addition to the existing curriculum because it prepares students who wish to work or seek additional education in neuroscience areas related to behavior. The proposed course contributes to the WKU mission by preparing students to conduct research and lead research efforts.
- 2. Projected enrollment in the proposed course: 30 per year. PSYS 360, Behavioral Neuroscience, enrollment is approximately 60 per year. Demand for the proposed course is expected to be less than PSYS 360.
- 3. Relationship of the proposed course to courses now offered by the department: PSYS 211, Research Methods Lab, is the only laboratory course currently offered by the Department of Psychological Sciences. PSYS 211 is focused on providing students with a broad exposure to techniques for collecting data within

psychology in connection with PSYS 210, Research Methods. The proposed course will focus entirely on research questions related to methods in Behavioral Neuroscience and provides greater depth to students in this sub-discipline. PSYS 360, Behavioral Neuroscience, is a lecture-based course that provides students with a foundation in the neurological processes and psychological constructs associated with the processes. The proposed course will extend this foundation, by providing a fundamentally different learning experience through integrative in-class lab activities that demonstrate methods used to advance the field of behavioral neuroscience. The activities will include in-class data collection and analysis. The proposed course will provide an important new opportunity for students who wish to enter medical, neuroscience and behavioral research areas at WKU or following graduation.

- 4. Relationship of the proposed course to courses offered in other departments: PSY 210 and PSY 211, offered by the Department of Psychology, are equivalent to PSYS 210 and 211. Please see the above description for the relationship between PSYS 361 and PSY 210/211. The Department of Biology offers BIOL 335, Neurobiology. BIOL 335 differs from the proposed course in that the proposed course concentrates on the relationship between neuroscience methods and approaches to psychological questions. Although the proposed course does not concentrate exclusively on humans, there is a greater emphasis on humans than non-human animals.
- 5. Relationship of the proposed course to courses offered in other institutions:
  A number of our benchmark institutions as well as other institutions in Kentucky offer a laboratory in areas related to behavioral neuroscience.

University	Course Number	Name	Credits	Notes
Eastern Kentucky University	PSY 315L	Sensation and Perception with Lab	4	PSY 315 is same course without lab component and is 3 credits
Eastern Kentucky University	PSY 317L	Cognitive Psychology with Lab	4	PSY 317 is same course without lab component and is 3 credits
Northern Kentucky University	PSY 338L	Cognitive Processes Laboratory	2	Offered in conjunction with PSY 338 Cognitive Processes
Northern Kentucky University	PSY 309L	Psychology of Perception Lab	2	Offered in conjunction with PSY 309 Psychology of Perception
University of Kentucky	PSY 456	Behavioral Neuroscience	4	Three hours of lecture and two hours of lab in the neural basis of behavior
Appalachian State University	PSY 4216	Biological Psychology Lab	1	Offered in conjunction with PSY 3216 Biological Psychology

Appalachian State University	PSY 4217	Cognitive Psychology Laboratory	1	Offered in conjunction with PSY 3217 Cognitive Processes
Bowling Green State University	PSYC 3280	Psychophysiology	4	Four lecture hours, laboratory by arrangement.
Florida Atlantic University	PSB 4004L	Laboratory in Psychobiology	3	Lecture and supervised laboratory methods and report writing in psychobiology
James Madison University	PSYC 493	Laboratory in Psychology	3	Lab course with topic defined by faculty member teaching the course
Middle Tennessee State University	PSY 4150	Laboratory in Psychology	1	Lab course in behavioral neuroscience offered as corequisite with lecture course
Northern Illinois University	PSYC 431	Neuropsychology	4	Lecture course with embedded labs
University of North Carolina Greensboro	PSY 435L	Brain and Psychological Processes with Laboratory	4	Lecture and lab course completed after statistics course

### 3. Discussion of proposed course:

- 1. Schedule type: C Lecture/Lab
- 2. Learning Outcomes:
  - o Identify research approaches to address research questions within behavioral neuroscience
  - o Understand the core neuroscience ideas and concepts (e.g., neuron function, physiological systems, sensory coding)
  - o Understand how typical neurophysiological systems are related to behavior
  - o Understand how physiological systems can become impaired and how behavior is changed by the impairment
  - o Demonstrate proficiency in neuroscience terminology and methods through hands-on lab activities
- 3. Content outline:
  - o Neuron structures and function
  - o Gross Brain structures
  - o Sensory and Perceptual systems
    - Visual System
    - Auditory System
    - Chemo-sensory Systems
    - Other Perceptual Systems
  - o Hormones and Reproductive Behavioral Systems
  - o Learning & Memory

- o Communication
- o Disorders
- 4. Student expectations and requirements:

Students will complete in-class and/or homework assignments related to the lab activities. Students understanding of course content will be assessed through quizzes and/or exams. Students will be expected to already have at least a rudimentary understanding of neuroscience and of behavioral research methods.

- 5. Tentative texts and course materials:
  - American Psychological Association. (2009). Publication Manual of the American Psychological Association, 6<sup>th</sup> ed. Washington, DC: APA.
  - American Psychological Association. (2010). *Concise Rules of Style, 6<sup>th</sup> ed.* Washington, DC: APA.
  - Carlson, N. R. (2014). *Foundations of Behavioral Neuroscience*, 9th ed. Boston, MA: Allyn and Bacon.
  - Kolb, B., & Whishaw, I. Q. (2015). Fundamentals of Human Neuropsychology, 7th Ed., New York, NY: Worth.
  - Diamond, M. C. & Scheibel, A. B. (1985) *The Human Brain Coloring Book*, New York, NY: Collins Reference
  - Pinel, P. J. (2013) Biopsychology, 9th ed. New York, NY: Pearson

#### 4. Resources:

1. Library resources: Existing resources are adequate.

### 5. Budget implications:

- 1. Proposed method of staffing: The course will be taught by current faculty. A number of faculty have neuroscience expertise within the Department of Psychological Sciences.
- Special equipment needed: Electrophysiological measurement equipment and brain models will be purchased using funds already committed by Academic Affairs. A portion of a course fee associated with this course will be used to periodically replace this equipment.
- Expendable materials needed: Dissection materials and electrodes will be purchased using funds already committed by Academic Affairs. A portion of a course fee associated with this course will be used to purchase the expendable materials each year.
- 6. Proposed term for implementation: Spring 2017

7.	Dates	of prio	rcomm	ittee a	pprovals:
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Department of Psychological Sciences	8/18/2016	
OCSE Curriculum Committee		
Undergraduate Curriculum Committee		
University Senate		

Proposal Date: 04 August 2016

## Ogden College of Science and Engineering Office of the Dean Proposal to Revise A Program (Action Item)

Contact Person: Les Pesterfield, <u>lester.pesterfield@wku.edu</u>, 745-3603

## 1. Identification of program:

- 1.1 Current program reference number: 734
- 1.2 Current program title: Middle School Science ("MSS")
- 1.3 Credit hours: 47

### 2. Identification of the proposed program changes:

2.1 Decrease the number of hours in the major from 47 to 30

## 3. Detailed program descriptions:

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Current	program

General:

## Proposed program

- 1. 23 hours of introductory science core courses are required.
- 2. A science research methods course, SMED 360, is required.
- 3. 21 hours of upper level science courses are required including a required course in each of the five disciplines and two from a list of restricted electives.
- 4. Completion of MATH 117 or 136 or 142 as a support course is required.
- 5. All courses must be completed with a grade of C or better. All science courses must be completed with an average GPA of 2.75 or better.
- 6. Students must also complete the SMED major.

- General:
- 1. **15** hours of introductory science core courses are required.
- 2. A science research methods course, SMED 360, is required.
- 3. 12 hours of upper level science courses are required including a required course in three of the five disciplines and one from a list of restricted electives.
- 4. Completion of MATH 117 or 136 or 142, **BIOL 120/121 and CHEM 105/106 or 120/121** as support courses is required.
- 5. All courses must be completed with a grade of C or better. All science courses must be completed with an average GPA of 2.75 or better.
- 6. Students must also complete the SMED major.

Required introductory science courses (23hrs)		Required introductory science courses (15 hours)	
ASTR 104	Astronomy of the	ASTR 104	Astronomy of the
Solar System (3)			Solar System (3)
or ASTR 106 Astronomy of		or ASTR 106	Astronomy of
Stellar Systems (3)			Stellar Systems (3)

BIOL 120/121 Biological Concepts:			T		
Evolution, Diversity & Écology (4)  CHEM 105/106 Fund. of Gen. Chemistry (4)     or CHEM 120/121 College Chemistry I (5)  GEOL 111/113 The Earth (4)     OR GEOL 112/114 Earth History (4)  PHYS 201 College Physics I (4)     or PHYS 231/232 College Physics     and Biophysics I (4)  Science research course:  SMED 360 Research Methods for     Mathematics and Science Teachers (3)  Upper level science courses (24 hours):  AH of following courses (45 hours):  ASTR 405 Astronomy for Teachers (3)  BIOL 303 Life Sciences for Middle Grades Teachers (3)  CHEM 470 Chemistry/Middle School (3) GEOL 305 Earth Systems Science for Teachers (3)  PHYS 410 Physics for Teachers (3)  Two restricted elective (min. 6 hours) from: BIOL 319/322 Molecular and Cell Biology (4) BIOL 325 Insect Biodiversity (3) BIOL 326 Ornithology (3) BIOL 327 Genetics (4) BIOL 334 Animal Behavior (3) BIOL 334 Animal Behavior (3) BIOL 334 Animal Behavior (3) BIOL 334 Plant Taxonomy (3) GEOG 471 Natural Resource Mgt. (3) GEOL 308 Structural Geology (4) GEOL 310 Global Hydrology (3) GEOL 311 Oceanography (3) GEOL 325 Intro Minerals and Rocks (3) GEOL 380 Intro Field Techniques (3) GEOL 380 Intro Field Techniques (3) GEOL 405 Paleontology (4)					
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	SMED 300	Middle Grade Science Skills (3)	SMED 300	Middle Grade Science Skills (3)	

SMED 400	Applying Middle Grade Science	SMED 400 Applying Middle Grade Science		
	Across Disciplines (3)	Across Disciplines (3)		
Support cour	ses	Support courses		
MATH 117	Trigonometry (3) or	MATH 117 Trigonometry (3) or		
MATH 136	Calculus I (4) or	MATH 136 Calculus I (4) or		
MATH 142	Calculus with Applications for			
	Life Sciences (5)			
		BIOL 120/121 Biological Concepts: Cells, Metabolism, and Genetics (4)		
		CHEM 105/106 Fund. of Gen. Chemistry (4) or CHEM 120/121 College Chemistry I (5)		

## 4. Rationale for the proposed program change:

The primary reason for the proposed change is to bring the number of required hours into alignment with other middle school science certification programs across the region.

	Science	Upper-	Support	Total
Institution	content	division	course	hours
	hours	hours	hours	
WKU current	47	24	3	50
proposed	30	15	11	41
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University of Louisville	32	6	14	46
Morehead State University <sup>3</sup>	33	9	6	39
Indiana State <sup>1</sup>	40	8	4	44
Middle Tennessee State <sup>1</sup>	28	4	12	40
University of Kentucky <sup>2</sup>	27	0	6	33
Northern Kentucky University <sup>2</sup>	23	0	6	29
Appalachian State <sup>1,2</sup>	26	0	4	30

<sup>&</sup>lt;sup>1</sup> benchmark institution, <sup>2</sup> dual certification program with math, <sup>3</sup> UTeach replication site

Middle school science education is unique in that middle school science (MSS) educators are not specialist in a single discipline but generalist across multiple content areas. The *Disciplinary Core Ideas* (DCI) as identified in the *Next Generation Science Standards* (NGSS) for middle school science instruction fall under three categories: Physical Sciences, Life Sciences, and Earth and Space Science. Given the wide range of topics found in the DCI's of MSS, a breadth of knowledge across the content areas of astronomy, biology, chemistry, geology and physics is necessary. As a result, middle

school science preparation programs are front-end loaded with a higher number of lower-division coursework hours than might be anticipated.

Additionally, even though the current MSS 734 major requires 47 hours, it is not a standalone major. All MSS majors must also declare a Science and Math Education Major (SMED) 774. The SMED major currently requires 34 hours (31 of which are unduplicated).

5.	Proposed term	for implementation	and special	provisions	(if applicable):
J.	i i oposcu term	i i oi impiementation	and special	hr o training i	in applicable)

Fall semester 2017

## 6. Dates of prior committee approvals:

SKyTeach Faculty	08/17/2016
Ogden Dean's Office	08/17/2016
Ogden College Curriculum Committee	
Professional Education Council	
Undergraduate Curriculum Committee	
University Senate	