CONSTRUCTIVISM AT OGLALA LAKOTA COLLEGE

I. Natural Science Curriculum

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PINE RIDGE RESERVATION

MA, BS, BSW, AA, AA/RN, AAS DEGREES

STUDENTS (~1800 in 2013-2014)
90% Native American, 60% Female, 50% Non-traditional

ACCREDITATION
Higher Learning Commission NCACS
ESTABLISHED IN 1999

DEGREES
AA Life Sciences (pre-medicine)
AA Science, Engineering, & Math (pre-engineering)
AAS & BS Information Technology
BS Natural Science (Conservation Biology, Earth Science)

STUDENTS
180 declared majors, 18 paid interns (2013-2014)

FACULTY
6 Teaching Faculty
5 Teaching/Research Staff
2 Outreach Staff

14 Adjuncts
4 Support Staff
CONSTRUCTIVISM

Creating knowledge while exploring the world through meaningful personal experiences

Bodner (1986)  
Bodner & others (2001)  
Coburn (1993)  
Coburn (1996)  
Duit & Treagust (1995)  
Gijbels & others (2005)  
Gordon (2009)  
Hay & Barab (2001)

Kroll (2004)  
Lucero (2006)  
Speed (1991)  
Stauffacher & others (2006)  
Strommen & Lincoln (1992)  
Terwell (1999)

(And yet we’re still objective empirical reductionists...)
SO WHAT DOES THAT LOOK LIKE FOR US?
(since realigning the science curriculum in 2008)

PLACE-BASED
Research on reservation and vicinity establishes local expertise

SELF SELECTED
Promotes continued engagement and personal responsibility

SERVICE LEARNING & RESEARCH
Establishes relevance and promotes program visibility

CULTURAL PRESERVATION
Maintains focus on OLC Vision, Lakota values and worldview

NON-ABANDONMENT
Demonstrates departmental commitment and promotes completion
LOWER DIVISION CLASSES

GENERAL STUDIES CLASSES
Basic content knowledge
Theoretical background

100-LEVEL CLASSES
Survey of OLC MST research programs
Recruitment tool for OLC MST degrees

200-LEVEL CLASSES
emphasize the scientific method
technical writing
guided research experience
UPPER DIVISION CLASSES

300-LEVEL CLASSES
- Project-based assignments
- Mentor-selected research projects
- In-house dissemination

400-LEVEL CLASSES
- Research-oriented assignments
- Self-selected research projects
- Professional dissemination (abstracts & papers)
UNDERGRADUATE RESEARCH

CAPSTONE SEQUENCE
NSci 273 Scientific Writing
NSci 393 Research Methods
NSci 493 Senior Research

IN PRACTICAL, SIMPLE TERMS
1) Pick a research topic that you like and find interesting
2) Meet with a mentor to get started and for continued guidance
3) Internships aren’t required, but get one if you can
4) Pick you classes, and spin their work, towards your research
5) Spend as much time in the field or lab as you can
6) Go to meetings and present as often as you can
7) If you change your mind, repeat 1-2
8) STAY BUSY!
OLC MST’s RESEARCH-BASED CURRICULUM

Conservation Biology electives

100 LEVEL

NSci 273 SCIENCE WRITING

200 LEVEL

NSci 393 RESEARCH METHODS

300 LEVEL

NSci 493 SENIOR RESEARCH

400 LEVEL

BACHELOR OF SCIENCE in NATURAL SCIENCE

Earth Science electives

100 LEVEL

200 LEVEL

300 LEVEL

400 LEVEL
EXTERNAL FUNDING

2009 NSF TCUP Phase III (Tinant & LaGarry)
2009 NSF SD EPSCoR R2 T1 (LaGarry)
2009 NIH SD BRIN (Sandoval)
2009 USDA NIFA TCEP (LaGarry)
2010 NSF PEEC (Tinant & LaGarry)
2011 USDA NIFA TRP (Higa)
2012 NSF RIG (Higa)
2012 NASA SD EPSCoR Wireless (Dudek)
2014 NSF SD EPSCoR R2 T1 (LaGarry)
2014 USDA NIFA TCEP (LaGarry)

(works out to about $1.5 M per year on average)
INFRASTRUCTURE

GIS Laboratory with computers, scanners, and plotters
2 High-Capacity Sun Computer Workstations
Atomic Absorption Mass Spectrometer (acetylene flame)
Atomic Absorption Mass Spectrometer (graphite furnace)
ICP Emission Photospectrometer (housed at SDSU)
X-Ray Diffractometer
Hand-held and Benchtop X-Ray Fluoroscopes
High Performance Liquid Chromatograph
Ion Chromatograph Mass Spectrometer
Microbiology Laboratory with Autoclaves and Incubators
Geoprobe with Field Laboratory Trailer
LiDAR Camera and Portable Power Supplies
Tribal Specimen Repository and Natural History Collections
2 4WD Field Vehicles and an ATV w/Trailer

And all the field notebooks I could possibly want
PRE-ENGINEERING
Geological mapping of the Whiteclay Fault
PRE-ENGINEERING
Freshwater ecology & hydrology
CONSERVATION BIOLOGY
Swift fox reintroduction
CONSERVATION BIOLOGY

Bison ecology & behavior
CONSERVATION BIOLOGY
New in 2014: Prairie restoration
EARTH SCIENCE
Radionuclide contamination
EARTH SCIENCE
Paleogene lithostratigraphy
CHEMISTRY
Pharmacology, biofuels, contamination
NEW IN 2013: CULTURAL RESOURCE MANAGEMENT
Lilly Sanovia (left), BS 2013 (NSF Graduate Research Fellow)
2014 South Dakota School of Mines & Technology
GRADUATION RATES

(since the start of longitudinal tracking)
SINCE 2008...

GRADUATES
15 students graduated from our AA programs
26 students graduated from BS programs
67% matriculation rate
(46% OLC as a whole)

PLACEMENT OF BS GRADUATES
25 of 26 (96%) in graduate school or workforce
7 of 26 (27%) currently in graduate school
18 of 26 (69%) currently in the workforce
13 of 18 (72%) employed on the Pine Ridge Reservation.

Data from NSF TCUP III YR 5 Annual Report 9/25/2014
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- National Science Foundation
- Oglala Sioux Tribe President’s Office
- Oglala Sioux Tribe Land Office
- OST Natural Resources Regulation Agency
- OST Tribal Historical Preservation Office
- Oglala Sioux Parks & Recreation Authority
- Black Hills State University
- South Dakota School of Mines & Technology
- South Dakota State University