Spring 2-1-2019

GEO 595.01: ST - Numeracy: The Power of Numbers

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Numeracy: 
the power of numbers
Sponsored by UM BRIDGES
Course Syllabus

Spring 2019 — 1 credit
GEO 595: Special Topics
CRN 35573
Selected Mondays 11:30-1:50pm and Thursdays 12:30-1:50pm
Location: TBD – likely different for Mondays and Thursdays

Contact Information

Instructor: Rebecca Bendick, PhD
Professor
Department of Geosciences
No office hours will be offered for this seminar
Please direct all inquiries to convener,
Alisa Wade

Convener: Alisa Wade, PhD
Faculty Affiliate/Program Coordinator
Department of Geosciences/UM BRIDGES
Clapp Building (CHCB) #535
Please contact via email
alisa.wade@umontana.edu
Office Hours: by appointment

Course Description

In this 1.0 credit workshop-style seminar, you will explore tools and tricks for using numbers skillfully, comfortably, and powerfully. Numeracy is as fundamental to our modern society as literacy, but it gets much less attention. Numbers, mathematics, and quantitative reasoning underpin almost all of the decisions and debates that face us every day at every level. Whether you fear math or love it, but recognize its centrality in understanding the science and solutions surrounding current events, this is a workshop for you.

Course Assessment

Course grading is on “credit-no credit” option only. To receive credit for the workshop, you must be on time and attend all 8 meetings of the workshop. The course convener will take attendance each day. Students arriving more than 15 minutes late or leaving more than 15 minutes early will be marked as absent, unless a prior exception has been arranged with the course convener.

There are 3 possible exceptions to this attendance policy, although in no instance will students receive credit if they miss more than 2 of the workshop meetings:

1) Students may request an absence and make up work for one meeting, with at least 3 days advanced notice via email, to the course convener. The student should explain why they are unable to attend, and all requests may not be granted.
2) If a student will have a University-approved absence, students need to email the course convener at least one week (7 days) prior to the meeting they will miss and provide documentation. The UM “Class Attendance/Absence Policy” can be found in the UM Catalog (2018-2019) Academic Policies and Procedures.

3) If the student has a doctor-documented illness or family emergency, the student will provide a doctor’s note or other documentation within 7 days of the missed meeting.

Course Guidelines and Policies

Equal Access
The University of Montana assures equal access to instruction through collaboration between students with disabilities, instructors and Disability Services for Students (DSS). If you have a disability that adversely affects your academic performance, and you have not already registered with Disability Services, please contact Disability Services in Lommasson Center 154 or by calling 406.243.2243. We will work with you and Disability Services to provide an appropriate modification.

Student Conduct
All students must practice academic honesty. Academic misconduct is subject to an academic penalty by the course instructor and/or a disciplinary sanction by the University. All students need to be familiar with the Student Conduct Code.

Tentative Schedule
Topics may be subject to change.
Seminar meetings are held on Mondays at 11:30-1:50pm and Thursdays at 12:30-1:50pm.
The class location rotates Mondays and Thursdays – room TBA

Week of January 28
Basic tools for understanding quantitative problems
Monday 1/28: Introduction, case studies, orders of magnitude, dimensional analysis, Fermi problems
Thursday 1/31: Equations of state vs. empirical relations, frequentist statistics, curve-fitting

Week of February 4
Signal processing
Monday 2/4: Time and space series and Fourier methods
Thursday 2/7: Bayesian methods and forecasting

Week of February 25
Change and nonlinearity
Monday 2/25: Calculus, ODEs, PDEs, potential fields
Thursday 2/28: Stability analysis and bifurcation

Week of March 4
Emerging methods
Monday 3/4: Numerical simulation
Thursday 3/7: Data mining and machine learning