



Course Approval Form

For instructions see:
<http://registrar.gmu.edu/facultystaff/catalog-revisions/course/>

Action Requested:

Create new course Inactivate existing course Reinstate inactive course Undergraduate

Modify existing course (check all that apply)

Title Credits Repeat Status Grade Type Graduate

Prereq/coreq Schedule Type Restrictions

Other:

College/School: Department:

Submitted by: Ext: Email:

Subject Code: Number: Effective Term: Fall 2015
 Spring Year
 Summer

(Do not list multiple codes or numbers. Each course proposal must have a separate form.)

Title: Current
Banner (30 characters max w/ spaces)
New

Fulfills Mason Core Req? (undergrad only)
 Currently fulfills requirement
 Submission in progress

Credits: 3 Fixed or
 Variable to

Repeat Status: Not Repeatable (NR)
 Repeatable within degree (RD) Maximum credits allowed:
 Repeatable within term (RT)

Grade Mode: Regular (A, B, C, etc.)
 Satisfactory/No Credit
 Special (A, B, C, etc. +IP)

Schedule Type: Lecture (LEC)
 Lab (LAB)
 Recitation (RCT)
 Internship (INT)

Independent Study (IND)
 Seminar (SEM)
 Studio (STU)

Prerequisite(s):

Corequisite(s):

Instructional Mode:
 100% face-to-face
 Hybrid: ≤ 50% electronically delivered
 100% electronically delivered

Restrictions Enforced by System: Major, College, Degree, Program, etc. Include Code.

Are there equivalent course(s)?
 Yes No
 If yes, please list

Catalog Copy for NEW Courses Only (Consult University Catalog for models)

Description (No more than 60 words, use verb phrases and present tense)	Notes (List additional information for the course)
Explores the composition, classification, physical properties, and origin of soils.	
Indicate number of contact hours: <input type="text" value="3"/> Hours of Lecture or Seminar per week: <input type="text" value="3"/> Hours of Lab or Studio: <input type="text"/>	
When Offered: (check all that apply) <input type="checkbox"/> Fall <input type="checkbox"/> Summer <input checked="" type="checkbox"/> Spring	

Approval Signatures

Department Approval _____ Date _____ College/School Approval _____ Date _____

If this course includes subject matter currently dealt with by any other units, the originating department must circulate this proposal for review by those units and obtain the necessary signatures prior to submission. Failure to do so will delay action on this proposal.

Unit Name	Unit Approval Name	Unit Approver's Signature	Date

For Graduate Courses Only

Graduate Council Member _____ Provost Office _____ Graduate Council Approval Date _____

Course Proposal Submitted to the Curriculum Committee of the College of Science

1. COURSE NUMBER AND TITLE: GEOL 506

Course Prerequisites: Previous lab-science courses in each of the following: geology and chemistry (8 credit hours); or permission of instructor.

Catalog Description: Explores the composition, classification, physical properties, and origin of soils.

2. COURSE JUSTIFICATION:

Course Objectives: This course will provide one of the electives for the Earth Systems Science MS.

Course Necessity: AOES currently does not provide any GEOL electives for Earth Systems Science MS.

Course Relationship to Existing Programs: Course is designed to expand elective options for geologically-oriented MS students in support of the Earth Systems Science MS.

Course Relationship to Existing Courses: Course will be cross-listed with EVPP 503. This course was first taught in ESP when the geology faculty resided in that department in the past. EVPP master's and Ph.D. students will continue to have access to the course (EVPP 503) but now GEOL graduate students will have access as part of Earth Systems Science MS.

3. APPROVAL HISTORY: Approved by AOES faculty on 21 Nov 2014.

4. SCHEDULING AND PROPOSED INSTRUCTORS:

Semester of Initial Offering: Spring '16

Proposed Instructors: Dr. Julia Nord

5. TENTATIVE SYLLABUS: See separate syllabus (attached separately).

GEOLOGY 506 - SOIL SCIENCE

<http://mason.gmu.edu/~jnord/geol306/>

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PREREQUISITE	GEOL 101 and CHEM 103 or 211
CLASS MEETS	Wednesday 4:30 p.m. to 7:10 p.m. - Robinson B 218
INSTRUCTOR	Dr. Julia Nord, 3055 David King Hall Email Address - jnord@gmu.edu
OFFICE HOURS	Tuesday 3:00 p.m. to 4:00 p.m. and by appointment
TEXT	The Nature and Properties of Soils by Nyle C. Brady and Ray R. Weil, Fourteenth Edition, Pearson / Prentice Hall, 2008 (or similar edition) Additional Readings will also be assigned
MULTITASKING	Recent research shows that humans are not good at multitasking, in fact several peer reviewed journals state that "multitasking results in poorer learning and poorer performance". Please refrain from using phones and computers for text messages, Facebook, internet searching, shopping, IM and other related activities. IF we do not know the answer to a question as a group we can look it up during the break and have a discussion. IF you use a computer for note taking please do not use it for other purposes. IF you still want to multitask please sit on the back row. In-class multitasking and academic performance Computers in Human Behavior (2012) Multitasking in the University Classroom. International Journal for the Scholarship of Teaching and Learning Vol. 6, No. 2 (July 2012)
TOPICS	This class provides an introduction to the physical, chemical, and biotic properties of soils. We will discuss many issues relating to soil quality and soil stewardship. Without soil, the earth's surface would be barren rock or sand, silt, clay and gravel, and would not be able to support life. Soil is a biologically active zone where sunlight, water, the atmosphere and living things mix and interact with the Earth's rocks and minerals. Soil is constantly altering its composition in response to changing conditions. It supports a host of interdependent communities of living things which survive by endlessly exchanging energy and chemical resources (minerals, elements, nutrients etc). We will also study soil classification, soil mapping, and soil as a resource for agriculture, building sites, landfills, septic systems, and water (quality availability and movement). A knowledge of soils is necessary for site assessment, urban and regional planning, and pollution mitigation Humans are dependent on soils. Initially we used soil mainly for agriculture to support our growing population. Historically, poor soil stewardship resulted in the demise of many civilizations - and it is still uncertain how well soils will be able to support a growing, hungry population now over seven billion. Soils are becoming a scarce resource. The generation of dust from soil erosion is linked to increased cases of human disease, coral death, red tides, drought, and the end of the Ice Age. Dust is even implicated in the demise of the dinosaurs. Soil interactions will be very important as we investigate long-term Global Climate change.

All reading is expected to be done before class.

Make-up exams will only be allowed in exceptional (documented) circumstances.

This course abides by the rules of the [HONOR CODE](#).

Take Home assignments are available only on the web and will be linked below as they become available.

COURSE SCHEDULE

DATE	TOPICS	READINGS / ASSIGNMENTS
Jan. 22 Tuesday Week 1	Introduction. Syllabus. Pamunkey Soil What is soil? Soils and their uses. Four constituents - water, air, minerals (non-organic) and life (organic).	Chapter 1 To understand the range of disciplines intertwined with soil science look at http://en.wikipedia.org/wiki/Soil_science REMEMBER - Wiki is NOT peer reviewed. However this is a pretty good summary and I have checked it. For the USDA Pamunkey Soil https://soilseries.sc.egov.usda.gov/OSD_Docs/P/PAMUNKEY.html
Jan 29 Tuesday Week 2	Weathering of rocks and minerals. Soil formation. 5 soil forming factors. 4 soil forming processes Soil profile	Chapter 2
Feb. 5 Tuesday Week 3	Introduction to the physical properties of soils. Introduction to US soil taxonomy	Chapter 4 and Chapter 3 (76-90) Literature Assignment - due March 21st. Literature Assignment - Topics Format for Paper Takehome 1
Feb. 12 Tuesday Week 4	Hydrological Cycle Soil water Soil solution and plants.	Chapter 6 and Chapter 5
Feb. 19 Tuesday Week 5	Soils aeration and temperature More on soil taxonomy. Overview of the 12 soil orders.	Chapter 7 and Chapter 3 Reading: What Makes a Good Soil. Takehome 2
Feb 26 Tuesday Week 6	TEST 1 After test- Working with physical properties of soils. DK 2074	
March 5 Tuesday Week 7	Soil colloids, clay minerals and CEC	Chapter 8 Takehome 3
Mar. 12 Tuesday	Spring Break	
Mar. 19 Tuesday Week 8	Organisms and their residues. Detailed soil descriptions	Chapter 11 group projects assigned
SATURDAY March 23rd Algonkian Park field trip	A Describing soils in the field. Algonkian Park by the Potomac River	You MUST attend one of these to prepare for your final project

9:00 a.m. - 2:00 p.m. OR SUNDAY March 24th Algonkian Park field trip 12:00 noon - 5:00 p.m.	Directions	
Mar. 26 Tuesday Week 9	Carbon Cycle. Soil organic matter Soil Mapping and soil uses. Prepare for projects. Wetlands Teams and Garden Teams	Chapter 12
April 2 Tuesday Week 10	Macro elements. Nitrogen, Sulfur, Phosphorous and Potassium.	Chapter 13 and 14 Takehome 4
April 6th OR April 7th SATURDAY OR SUNDAY	Group Project Describing soils in the field at Environmental Studies on the Piedmont Environmental Studies on the Piedmont	
April 9 Tuesday Week 11	4:30 - 5:45 TEST 2 Meet in teams for final project report	
April 18 Tuesday Week 12	Presentations Hope in a Changing Climate	Takehome 4 due
April 23 Tuesday Week 13	Soils and Humans. Land Management issues. Micronutrients and nutrient management. Soil erosion.	Chapters 15 & 16 & 17
April 30 Tuesday Week 14	Soils and Humans. Soil erosion, soil pollution. Soils and Climate change	Chapters 18 & 20
May 14 Tuesday	Final Exam Same time, same place	

GRADING

Test 1	15%
Test 2	15%

Final Exam	20%
Group Project & Presentation	15%
4 Takehomes	20%
Literature Assignment	15%
Field Trips	<p>You must attend one of the field trips as preparation for the final project</p> <p>You must participate in a final project</p> <p>Occasionally the final project has been done at a different time - if - all team members agree</p>