

**UNIVERSITY OF KENTUCKY**  
**APPLICATION FOR CHANGE IN EXISTING COURSE: MAJOR & MINOR**

1. Submitted by College of Agriculture Date Dec. 4, 2002  
Department/Division offering course Acronomy
2. Changes proposed:  
(a) Present prefix & number PLS 366 Proposed prefix & number Same  
(b) Present Title Fundamentals of Soil Science  
New Title Same  
(c) If course title is changed and exceeds 24 characters (Including spaces), include a sensible title (not to exceed 24 characters) for use on transcripts:  
\_\_\_\_\_  
(d) Present credits: 3 hours 4 hours  
(e) Current lecture: laboratory ratio 3 hr lecture Proposed: 3 hr lec/3 hr lab  
(f) Effective Date of Change: (Semester & Year) Fall 2003
3. To be Cross-listed as: \_\_\_\_\_  
Prefix and Number \_\_\_\_\_ Signature: Department Chair \_\_\_\_\_
4. Proposed change in Bulletin description:  
(a) Present description (including prerequisite(s)):  
Development of concepts and understanding of the properties and processes that are basic to the use and management of soils. Prereq: CHE 105  
(b) New description:  
Study of the physical, chemical, and biological properties of soils and how these properties relate to plant nutrient availability and plant growth, land-use planning and management issues, and soil and water quality issues. Lecture, three hours; laboratory, 3 hours. Prereq: CHE 105.  
(c) Prerequisite(s) for course as changed: \_\_\_\_\_
5. What has prompted this proposal?  
A thorough introduction to soil science should always include laboratory experiences that allow the student to handle soil, see soil management issues, observe how soils impact environmental quality. The current course lacks a lab experience
6. If there are to be significant changes in the content or teaching objectives of this course, indicate changes:  
The primary change in content is the addition of lab experiences, including field trips and experiments, to illustrate principles of soil science. A syllabus, including a list of laboratory activities is attached.
7. What other departments could be affected by the proposed change?  
Landscape Architecture, Horticulture, Forestry, Animal Science, Agric. Economics, Agric. Education, Biological and Ag. Eng.
8. Is this course applicable to the requirements for at least one degree or certificate at the University of Kentucky?  Yes  No
9. Will changing this course change the degree requirements in one or more programs?  Yes  No  
If yes, please attach an explanation of the change.\*
10. Is this course currently included in the University Studies Program?  Yes  No  
If yes, please attach correspondence indicating concurrence of the University Studies Committee.
11. If the course is a 100-200 level course, please submit evidence (e.g., correspondence) that the Community College System has been consulted.

\*NOTE: Approval of this change will constitute approval of the program change unless other program modifications are proposed.

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12. Is this a minor change?  Yes  No  
 (NOTE: See the description on this form of what constitutes a minor change. Minor changes are sent directly from the Dean of the College to the Chair of the Senate Council. If the latter deems the change not to be minor, it will be sent to the appropriate Council for normal processing.)

Within the Department, who should be consulted for further information on the proposed course change?

Name: Dr. Michael Mullen Phone Extension: 4-4768

Signatures of Approval:

*[Signature]*  
 Department Chair

*[Signature]*  
 Dean of the College

**UNDERGRADUATE COUNCIL**

12/23/02 1/2/03  
 Date

2/14/03  
 Date

Date of Notice to the Faculty  
04-01-2003

Date

**\*\*Undergraduate Council**

**\*\*Graduate Council**

**\*\*Academic Council for the Medical Center**

**\*\*Senate Council**

Date

Date

Date of Notice to University Senate

\*\*If applicable, as provided by the Rules of the University Senate.

ACTION OTHER THAN APPROVAL

\*\*\*\*\*

The Minor Change route for courses is provided as a mechanism to make changes in existing courses and is limited to one or more of the following:

- a. change in number within the same hundred series;
- b. editorial change in description which does not imply change in content or emphasis;
- c. editorial change in title which does not imply change in content or emphasis;
- d. change in prerequisite which does not imply change in content or emphasis;
- e. cross-listing of courses under conditions set forth in item 3.0;
- f. correction of typographical errors. [University Senate Rules, Section III - 3.1]

Rev 8/02

Print Form

Clear Form

Syllabus  
**PLS 366**  
Fundamentals of Soil Science

**Instructor:** Dr. Mike Mullen

**Office:** N-122M Ag Sci Ctr N

**Office Hours:** Monday 3:00-4:30 pm  
Thursday 10:00-11:30 am

**Phone:** 257-4768

**Email:** [mmullen@uky.edu](mailto:mmullen@uky.edu) This is the best way to contact me!

**Class Homepage:**

Log in page is: <http://ecourses.uky.edu>

We will discuss how to get into the course in class. You will be expected to use the course homepage for online quizzes. You can also access your semester grades there at any time.

## **PREREQUISITE: CHEMISTRY 105**

**Lecture:** 8:00-9:15 a.m., Tuesday and Thursday in Room N-12 Ag Sci Ctr N

### **Course Description:**

Development of concepts and understanding of the properties and processes that are basic to the use and management of soils.

### **Course Objectives:**

When you finish this course you should:

1. Understand and be able to describe how soils form and the important chemical, physical, and biological processes that occur in soils.
2. Understand and be able to describe the interaction of the chemical, physical and biological properties of soil systems and how their activities affect the environment.
3. Gain an overall perspective of the importance of soils in diverse ecosystems, including agricultural and forested ecosystems, as well as urban ecosystems.
4. Gain an improved ability to solve basic problems related to soil and environmental sciences.

### **Reference Materials:**

**Textbook:** *The Nature and Properties of Soils* by NC Brady and RR Weil, 13<sup>th</sup> edition, Prentice Hall. Available in the bookstore. I will not require you to buy this text. But, my lectures will review the reading assignments that I make. These reading assignments are important to your understanding the course material and solving problems. I also use some of the questions from the text in problem sets. It, as well as the 12<sup>th</sup> edition, are on reserve in the AIC. If you are a PSS major, this is a valuable reference text for the future!

**Class Homepage:** This will serve as THE central nervous system for the course. The homepage has all the class information on it, as well as online access to grades, lab quizzes, practice quizzes, discussion forums, communications, and pertinent links to the web. The log-in site is at <http://ecourses.uky.edu/>. See separate handout for enrollment procedure. If you do not enroll on the homepage, you will not pass the class as online quizzes are required.

**Other Sources:** Other sources of information will be made available via the class homepage or by handouts in class. For each topic, there will generally be a folder in the **Class Materials** section of the web page. There you will find links to other sites with good, related information.

**Class organization:**

The course is arranged by topic area. See attached lecture schedule for a listing of topics to be covered. During most lectures, we will do some activities to reinforce learning. Studies have shown that students gain little from very long lectures, so we will avoid me talking for 75 minutes straight!

Alternative activities will include general discussions, short classroom assessment techniques, the occasional video, and working on problem solving.

Reading assignments in the textbook supplement the lecture material. You are responsible for material in the text whether it is covered or not. Questions on the practice quizzes may come from the text, and some will be used in exams.

Lab activities generally parallel lecture topics. These activities serve to reinforce principles and to help develop practical skills in soil science.

**Course Grading:**

I expect a lot from you! This class is rigorous and will require a good deal of effort on your part to make an A. An A is given for EXCELLENT work, while a C is given for AVERAGE work. It is up to you to decide how much or how little you will put into the class. There are many opportunities for evaluation, and a few opportunities to recover from poor performances. However, I do not give extra credit, so please do not ask! Here is the breakdown of how you will be evaluated:

Category	Points
3 hour exams @ 100 points each	300
10 of 12 online quizzes at 10 pts each	100
8 problem sets @ 25points each	200
Laboratory activities	200
Final Exam (50 points comprehensive over entire course)	150
Total Points	950

**Grading Scale:**

A = 90-100%

B = 80-89%

C = 70-79%

D = 62-69%

E = < 62%

**What if I need to be absent?**

There are often times when a student will NEED to be absent from a class. I understand that, as I too will be absent a day or two during the semester. However, I do have some guidelines. Notify me as soon

as possible before a scheduled exam if you cannot make it **for a valid reason**. Valid reasons include participation in scheduled UK events or emergencies (illness, accidents, family crises). For UK events, you must provide a written notice signed by the instructor or coach informing me of the event and your participation **BEFORE** the scheduled exam. For emergencies, I expect documentation of the event proving your need to be absent.

### **Academic Integrity:**

Scholastic dishonesty is not tolerated. Forms of scholastic dishonesty include, but are not limited to: plagiarism (copying or using someone else's work as your own), utilization of unauthorized materials during academic evaluations, and giving or receiving unauthorized assistance during evaluations. The first offense will result in a grade of 0 for that particular assignment. A second offense will result in disciplinary action. For more information, see Part II of "The Code of Student Conduct" which can be viewed online at <http://www.uky.edu/StudentAffairs/Code/part2.html> or can be obtained in the Dean of Students Office.

**6.3.0 ACADEMIC OFFENSES AND PROCEDURES** Students shall not plagiarize, cheat, or falsify or misuse academic records.

**6.3.1 PLAGIARISM** All academic work, written or otherwise, submitted by students to their instructors or other academic supervisors, is expected to be the result of their own thought, research, or self-expression. In cases where students feel unsure about a question of plagiarism involving their work, they are obliged to consult their instructors on the matter before submission.

When students submit work purporting to be their own, but which in any way borrows ideas, organization, wording or anything else from another source without appropriate acknowledgment of the fact, the students are guilty of plagiarism.

Plagiarism includes reproducing someone else's work, whether it be published article, chapter of a book, a paper from a friend or some file, or whatever. Plagiarism also includes the practice of employing or allowing another person to alter or revise the work which a student submits as his/her own, whoever that other person may be. Students may discuss assignments among themselves or with an instructor or tutor, but when the actual work is done, it must be done by the student, and the student alone.

When a student's assignment involves research in outside sources or information, the student must carefully acknowledge exactly what, where and how he/she has employed them. If the words of someone else are used, the student must put quotation marks around the passage in question and add an appropriate indication of its origin. Making simple changes while leaving the organization, content and phraseology intact is plagiaristic. However, nothing in these Rules shall apply to those ideas which are so generally and freely circulated as to be a part of the public domain.

**6.3.2 CHEATING** Cheating is defined by its general usage. It includes, but is not limited to, the wrongfully giving, taking, or presenting any information or material by a student with the intent of aiding himself/herself or another on any academic work which is considered in any way in the determination of the final grade. Any question of definition shall be referred to the University Appeals Board.

PLS 366 Lecture Topics for Fall 2002

Date	UNIT #	Topic	Reading Assignment
Aug 29	1	Intro to class: Photos. Defining Soils - Basic Properties: soil color, horizons, profiles, peds	Chapter 1, pp 1-20
Sep 3	2	<b>Soil Physical Properties:</b> texture, structure, soil density and porosity, engineering properties	Chap 4, pp. 121-159 & 165-173
Sep 5		No Class	
Sep 10 Sep 12	3	<b>Soil Formation:</b> rocks and minerals, weathering, 5 soil forming factors, 4 soil building processes, soil horizons	Chap. 2, pp. 31- 74
Sep 17 Sep 19	4	<b>Soil Classification:</b> soil individuals, diagnostic surface horizons, diagnostic subsurface horizons, soil moisture and temperature regimes, soil taxonomy, the 12 soil orders	Chap. 3, pp 75-111
<b>Sep 24</b>	<b>First Hour and 15 minute exam!</b>		
Sep 26 Oct 1	5	<b>Soil Water:</b> properties of water, concepts of soil water energy, soil water content, water flow in soil, infiltration and percolation, categories of soil water content, how do plants get water? the hydrologic cycle; aeration and temperature	Chap. 5, pp. 176- 213; Chap 6, pp 219-222; Chap 7, pp. 272-279 & 305-313
Oct 3 Oct 8	6	<b>Soil Chemical Properties:</b> soil colloids, cation exchange properties, cation and anion exchange reactions	Chap. 8, pp 316-360
Oct 10 Oct 15	7	<b>Soil Acidity:</b> pH relationships, sources and pools of soil acidity, ph and cations, soil buffering capacity, effects on soil life, changing soil pH, alkaline and salt-affected soils	Chap. 9, pp. 363-409 and Chap. 10, pp 412-429
<b>Oct 17</b>	<b>Second Hour and 15 minute exam!</b>		
Oct 22 Oct 24	8	<b>Biological Properties of Soils:</b> diversity of organisms, importance of various organisms in soil, bacteria, algae, fungi, micro- and macro-fauna, ecological relationships, carbon cycle, decomposition processes, factors controlling decomposition and mineralization.	Chap. 11, pp. 449-495 Chap 12, pp. 498-511
Oct 29	9	<b>Soil Organic Matter:</b> organic matter formation, benefits and management of organic matter, organic soils; composting, container media.	Chap. 12, pp. 512-533

Continued on next page

Date	UNIT #	Topic	Reading Assignment
Oct 31	10	<b>Soil Nitrogen:</b> The N cycle, inputs (fertilizers, atmospheric deposition, biological n-fixation), transformations (mineralization, immobilization, nitrification, denitrification), losses (runoff, leaching, crop removal, denitrification, ammonia volatilization), agronomic and environmental concerns	Chap. 13, pp. 543-575
Nov 7	11	<b>Soil Phosphorus:</b> Forms of P, Fertilizers, Agronomic and Environmental Concerns	Chap 14. pp. 592-620
Nov 12	<b>NO CLASS: Soil Science Society of America Meetings in Indianapolis</b>		
Nov 14	<b>Third Hour and 15 minute exam!</b>		
Nov 19	12	<b>Soil Potassium, Secondary Nutrients, Micronutrients:</b> forms, fertilizers, deficiencies and toxicities of micronutrients	Chap 14, pp. 621-634; Chap.15, pp 638 - 651
Nov 21 Nov 26	13	<b>Nutrient Management Issues:</b> soil testing, manure and biosolids handling, N vs P applications, BMPs, fertilizer use, nutrient management plans	Chap 16, pp. 669-680, pp. 688-725
Nov 28	<b>NO CLASS - Thanksgiving</b>		
Dec 3 Dec 5	14	<b>Soil Erosion and Its Management:</b> The erosion process, damage from erosion, predictions of erosion, tillage, principles of erosion control, practices for erosion control	Chap. 17, pp. 740-772
Dec 10	15	<b>Soil Surveys:</b> Use for land management, GIS applications (in class exercise)	Chap. 19, pp. 859-868
Dec 12	16	<b>Wetland Soils:</b> hydric soils, wetland values and functions.	Chap 7, pp 287-294, online resources
Dec 19	10:30-12:30	<b>FINAL EXAM</b>	

**Laboratory Exercises for PLS 366  
Fundamentals of Soil Science Lab**

TOPIC	
Exercise 1:	Rocks, Minerals and Parent Materials
Exercise 2:	Soil Forming Factors: Simulated Physical and Chemical Weathering
Exercise 3:	Color, Texture, Structure, Profiles
Exercise 4:	Field Exercise: Soil Morphology, Profiles, and Landscapes
Exercise 5:	Physical Properties: Mechanical Analysis, Density, Porosity, Engineering Applications
Exercise 6:	Field Exercise: Soil Water - Infiltration and Percolation
Exercise 6:	Soil Chemical Properties: Ion Exchange Properties of Soil
Exercise 7:	Soil Acidity and Limestone Requirements
Exercise 8:	Soil Biology: Organisms and their Activities
Exercise 9:	Nutrients and Environmental Quality: N and P Determinations in Soil and Water
Exercise 10:	Field Trip: Tour of UK Soil Testing Laboratories
Exercise 11:	Soil Erosion and Management: Use of RUSLE in Soil Conservation Planning
Exercise 12:	Applied Soil Taxonomy: Use of Soil Surveys for Decision Making