SOIL 0630 Soil Fertility
September - December 2014

Dr. Don Flaten, Dept. of Soil Science, 307 Ellis Building
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Course Objectives - After completing this course, students will have a practical understanding of nutrient requirements and management for crop production. Students will also understand the implications of soil fertility management practices on agricultural sustainability and environmental protection.

Role of Summary Notes - This set of notes is only an outline of information covered in lectures. Students are expected to participate in lectures, where this material will be discussed and expanded upon. Students are strongly encouraged to expand and adapt the notes in order to complete and personalize their class notes for effective understanding, reference and studying. Cost for the summary notes and the reference material for lab exercises is $5.00.

References (not required texts):
Soil Fertility Guide. 2007. Manitoba Agriculture, Food and Rural Initiatives (will be handed out in lab, but is also available on-line)

Evaluation and Marking Scheme:  Evaluative feedback will be given to students prior to the voluntary withdrawal deadline. The quizzes will be written over a 15 minute period in the regular lecture slot. The midterm test will be written during the regular 80 minute lecture period. The final exam will be two-hours in length. Weighting of components is as follows:

Quizzes: ................................. 15%  Oct. 9, Oct. 23, Nov. 20 ... 8:30-8:45 am
Midterm exam .......................... 15%  Nov. 6
*Laboratory (Room 245 Ellis Bldg):
  - weekly problems .................... 10%  at end of each lab period
  - term project .......................... 15%  due Dec. 5
  - lab exam............................. 15%  in lab, open book Dec. 5
Final exam.............................. 30%  t.b.a.
*Attendance and satisfactory completion of the laboratory are compulsory.

General Grading Scheme (subject to modification by instructor):

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<thead>
<tr>
<th>Score</th>
<th>Grade</th>
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<tbody>
<tr>
<td>90-100</td>
<td>A+</td>
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<tr>
<td>80-89</td>
<td>A</td>
</tr>
<tr>
<td>75-79</td>
<td>B+</td>
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<tr>
<td>70-74</td>
<td>B</td>
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<tr>
<td>65-69</td>
<td>C+</td>
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<td>60-59</td>
<td>C</td>
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<td>50-59</td>
<td>D</td>
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<td>&lt;50</td>
<td>F</td>
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All assignments must be completed satisfactorily by December 5th to receive a passing and complete grade. Grammar, spelling and composition will be evaluated and considered as part of the grading criteria for tests and assignments. Academic dishonesty will be treated seriously (see the U of M General Calendar for policies on plagiarism, cheating, and impersonations at exams).

Availability of Instructor:
Students with inquiries or suggestions are welcome to “drop in” to the office (Room 307 Ellis Bldg.) at their convenience. However, other obligations frequently interfere with my availability for students. Therefore, to make best use of your time, please call me or send me an e-mail to set up an appointment.
SOIL 0630 Soil Fertility Course Outline
(Draft – September 9, 2014)

Approx. Approx.
# lectures

1 I. Introduction and Review
   A. Role of soil fertility for crop production
   B. Overview of nutrient use, uptake and movement

2 II. Effects of Soil Solids, Surfaces and Solutions on Soil Fertility
   A. Soil mineral solids: weathering, precipitation, dissolution of nutrients
   B. Soil organic solids: solubilization, immobilization and mineralization of nutrients
   C. Soil surfaces: adsorption and desorption of nutrients
   D. Effects of pH: acidity and alkalinity
   E. Effects of aeration: oxidation and reduction

III. Soil Fertility and Fertilizers

Nutrient by nutrient discussion of forms and behaviour of nutrients in soil; nutrient uptake, utilization and deficiency symptoms; fertilizer sources, properties and reactions; and fertilization practices for:

4 A. N
1 B. S
2 C. P
1 D. K
3 E-M. Ca, Mg, Mo, B, Cl, Cu, Zn, Mn, Fe

IV. Soil Fertility Management - General Issues
1 A. Manure management
1 B. Fertility evaluation, fertilizer recommendations
1 C. Soil fertility and agricultural sustainability
1 D. Soil fertility and environmental issues