RUTGERS
School of Environmental and Biological Sciences

Soil Management for Sports Fields and Landscapes

11:776:404 (3 credits)
Spring Semester (even years)
Monday, Thursday (lecture) 9:15 – 10:35 AM 194 Foran Hall

CONTACT INFORMATION

Instructor:	Dr. James Murphy
Office Location:	270 Foran Hall, 59 Dudley Rd., New Brunswick, NJ 08901
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Office Hours:	by arrangement

COURSE DESCRIPTION

The course integrates the principles of soil and plant sciences needed to understand the management of turf and other plants in a variety of landscape settings. The course uses lecture, some field and laboratory experience, and field trips to teach principles of turf soil science and management. Topics include manipulation of soil for drainage and supply of water for plants, efficient application of water through irrigation, use of effluent and poor quality water for irrigation, managing soil for plant nutrition, and turf management using organic principles.

This course is strongly suggested for students seeking career opportunities in the science and management of landscapes including lawns, gardens, parks, roadsides, cemeteries, athletic fields, golf courses, etc. as well as the commercial supplies industry associated with landscape management.

COURSE WEBSITE, RESOURCES AND MATERIALS

- Course website: Canvas
- Required readings to supplement lectures will be distributed as handouts
- Suggested textbooks (not required):
  Carrow, RN, DV Waddington and PE Rieke. 2001. Turfgrass Soil Fertility and Chemical Problems: Assessment and Management. Ann Arbor Press, Chelsea, MI
  Gibbs, RJ and WA Adams. 1994. Natural Turf for Sport and Amenity: Science and Practice. CAB International, Cambridge, MA
  Brady, NC and RR Weil. 2002. The Nature and Properties of Soils. 13th. Prentice Hall, Upper Saddle River, NJ
  Carrow, RN and RR Duncan. 1998. Salt-affected Turfgrass Sites: Assessment and Management. Ann Arbor Press, Chelsea, MI

PREREQUISITES

11:375:360 Soils and Water OR equivalent

COURSE LEARNING GOALS

(Link to Plant Biology Undergraduate Program Goals: http://plantbiology.rutgers.edu/undergrad/plantbiology/)

By the end of this course, the student will be able to:

1. Assess soil health and its impact on landscape function (addresses program goal 1)
2. Discuss soil management as it relates to organic management of landscapes (addresses program goals 1 and 3)
3. Describe how highly trafficked turf is maintained and repaired (addresses program goal 1)

4. Recognize how nutrient management in landscapes occurs (addresses program goal 1)
5. Discuss how soil water is managed via drainage and irrigation (addresses program goals 1 and 3)

ASSIGNMENTS/RESPONSIBILITIES AND ASSESSMENT

Grading

- Out of class assignments (4, 5% each) 20%
- Exams (4, 15% each) 60%
- Comprehensive class project 20%
- Scale: 90-100 = A; 80-89 = B; 70-79 = C; 60-69 = D

Learning goals assessment: Student attainment of the learning goals will be assessed through classroom discussions, quizzes and exams (all learning goals) and a comprehensive class project (oral presentation and report) (course learning goals 2 and 5). The percentage score on these assessments will determine the level of mastery: >90% outstanding; 80-89% good; 70-70% satisfactory; <69% unsatisfactory.

PARTICIPATION GRADE AND ABSENCE POLICY

Attendance is mandatory and discussion in class is expected. Students unable to attend may contact the instructor via e-mail prior to the missed class or may use the University absence reporting website (https://sims.rutgers.edu/ssra/) to indicate the date and reason for the absence. An e-mail is automatically sent to the instructor.

COURSE TOPICS

1. Environmental Perspectives
   a. Mankind and Soil
   b. Sustainability; Functions of Turf: Protection of Soil and Water
   c. Nutrient Pollution of Water
   d. Organic Principles of Soil Management
2. Landscape Construction
   a. Land Use and Soil Assessment – US Soil Survey Website
   b. Construction and Soil Degradation
   c. Drainage Designs
   d. Construction of Native Soil, California, and USGA Root Zones
   e. Soil Preparation for Turfgrass Establishment
   f. CU-Structural Soil for Urban Trees
   g. Construction Management
3. Passive and Sports Traffic: Effects on Soil
   a. Traffic Control
   b. Enhancing Tolerance to Traffic
      i. Mowing
      ii. Fertilization
      iii. Irrigation
      iv. Cultivation
      v. Topdressing
   c. Recovery from Traffic
   d. Design and Build Considerations for Intensively Trafficked Sites
4. Irrigation
   a. Efficient Application of Water through Irrigation
   b. Use of Effluent and Poor Quality Water for Irrigation
   c. Assessing Chemical/Nutrient Status of Water Quality

5. Salt-affected Soil and Management
6. Managing Soil for Plant Nutrition
   a. Assessing Chemical/Nutrient Status of Soil
   b. Nitrogen and Liquid/Foliar Fertilization
   c. Fertilizer Scheduling, Selection, Calculations

COURSE SCHEDULE

Week	Topics
1	Introduction; Class trip to Central Park; Mankind and soil
2	Mankind and soil; Sustainability; Functions of Turf; Protection of soil and water quality; Organic management
	Assignment 1
3	Organic management (cont.)
4	**Exam (online)**
	Nutrient pollution of water; Assessing soil fertility
	Assignment 2
5	Assessing soil fertility; Nitrogen fertilization and scheduling
	Assignment 3
6	Nitrogen fertilization and scheduling (cont.); Other nutrients and calculations; Granular and liquid fertilizers and biostimulants
7	Granular and liquid fertilizers and biostimulants (cont.); Irrigation; Irrigation water quality
8	Irrigation water quality (cont.); Salt-affected soil: assessment and management
	Exam (in class)
	Spring recess
9	Salt-affected soil: assessment and management (cont.); Wear and compaction of soil
10	Soil texture and lab demonstration; Salt-affected soil: assessment and management (cont.); rutting and devoting
11	Traffic control: enhancing tolerance and recovery from traffic
12	Cultivation of soil
	Assignment 4
	Exam (in class)
13	Topdressing; Construction: assessment drainage
14	Agricultural concept and strip drainage design; Root zone designs
15	Sand root zones and structural soil for trees
	Final project due
Exam (final exam; date to be determined)	

FINAL EXAM/PAPER DATE AND TIME

The Online Final exam Schedule: http://finalexams.rutgers.edu/

ACCOMODATIONS FOR STUDENTS WITH DISABILITIES

Please follow the procedures outlined at https://ods.rutgers.edu/students/registration-form. Full policies and procedures are at https://ods.rutgers.edu/

ACADEMIC INTEGRITY

The university's policy on Academic Integrity is available at http://academicintegrity.rutgers.edu/academic-integrity-policy/

The principles of academic integrity require that a student:

- Properly acknowledge and cite all use of the ideas, results, or words of others.

- Properly acknowledge all contributors to a given piece of work.
- Make sure that all work submitted as his or her own in a course or other academic activity is produced without the aid of impermissible materials or impermissible collaboration.
- Obtain all data or results by ethical means and report them accurately without suppressing any results inconsistent with his or her interpretation or conclusions.
- Treat all other students in an ethical manner, respecting their integrity and right to pursue their educational goals without interference. This requires that a student neither facilitate academic dishonesty by others nor obstruct their academic progress.
- Uphold the canons of the ethical or professional code of the profession for which he or she is preparing.

Adherence to these principles is necessary in order to ensure that:

- Everyone is given proper credit for his or her ideas, words, results, and other scholarly accomplishments.
- All student work is fairly evaluated and no student has an inappropriate advantage over others.
- The academic and ethical development of all students is fostered.
- The reputation of the University for integrity in its teaching, research, and scholarship is maintained and enhanced.

Failure to uphold these principles of academic integrity threatens both the reputation of the University and the value of the degrees awarded to its students. Every member of the University community therefore bears a responsibility for ensuring that the highest standards of academic integrity are upheld.

STUDENT WELLNESS SERVICES

Just In Case Web App http://codu.co/cee05e

Access helpful mental health information and resources for yourself or a friend in a mental health crisis on your smartphone or tablet and easily contact CAPS or RUPD.

Counseling, ADAP & Psychiatric Services (CAPS)
(848) 932-7884 / 17 Senior Street, New Brunswick, NJ 08901/ www.rhscaps.rutgers.edu/

CAPS is a University mental health support service that includes counseling, alcohol and other drug assistance, and psychiatric services staffed by a team of professional within Rutgers Health services to support students' efforts to succeed at Rutgers University. CAPS offers a variety of services that include: individual therapy, group therapy and workshops, crisis intervention, referral to specialists in the community and consultation and collaboration with campus partners.

Violence Prevention & Victim Assistance (VPVA)
(848) 932-1181 / 3 Bartlett Street, New Brunswick, NJ 08901 / www.vpva.rutgers.edu/

The Office for Violence Prevention and Victim Assistance provides confidential crisis intervention, counseling and advocacy for victims of sexual and relationship violence and stalking to students, staff and faculty. To reach staff during office hours when the university is open or to reach an advocate after hours, call 848-932-1181.

Disability Services
(848) 445-6800 / Lucy Stone Hall, Suite A145, Livingston Campus, 54 Joyce Kilmer Avenue, Piscataway, NJ 08854 / https://ods.rutgers.edu/

Rutgers University welcomes students with disabilities into all of the University's educational programs. In order to receive consideration for reasonable accommodations, a student with a disability must contact the appropriate disability services office at the campus where you are officially enrolled, participate in an intake interview, and provide documentation: https://ods.rutgers.edu/students/documentation-guidelines. If the documentation supports your request for reasonable accommodations, your campus's disability services office will provide you with a Letter of Accommodations. Please share this letter with your instructors and discuss the accommodations with them as early in your courses as possible. To begin this process, please complete the Registration form on the ODS web site at: https://ods.rutgers.edu/students/registration-form.

Scarlet Listeners
(732) 247-5555 / http://www.scarletlisteners.com/

Free and confidential peer counseling and referral hotline, providing a comforting and supportive safe space.