Annual Report for Assessment of Outcomes 2011-2012

Please address the questions below
send to *learningassessment@pcc.edu* by **June 22, 2012;** with Annual Report in the subject line

Note: Information provided in this report may be inserted into or summarized in Section 2C (LDC/DE)) or 6B (CTE) of the Program Review Outline.

Submitted: June 22, 2012

SAC: LAT; Landscape Technology

Outcomes Assessed: Landscape Technology AAS

1. Describe changes that have been implemented towards improving students' attainment of outcomes that resulted from outcome assessments carried out in 2010-2011. These may include but are not limited to changes to content, materials, instruction, pedagogy etc.

Last year we submitted a plan to assess the Landscape Technology AAS Degree and program using our **LAT 280A CE: Landscape** class taken by all students for 6 credits of work experience. While our approach seemed reasonable, and the employer rubric came back with promising reviews of student's skills; it lacked enough volume (low number of students assessed due to the variability of class size) to be statistically valid and it hardly directed us to *where* to change the program itself. In general, it produced an affirmation of successful program outcomes, i.e. employers gave high marks to our students and their skills, but it was not a reasonable way to discover where we might need improvement specifically to classes, or to the program overall. Therefore, it was scrapped at the beginning of this year in favor of an assessment that would capture greater numbers of students and focus on each individual LAT area.

This year, after much discussion with our assessment coach Jessica Bernards, we put together a more rounded approach addressing the three major areas of our LAT program - Landscape Design, Landscape Construction and Landscape Management. Also, in the past year we have developed our curriculum to change classes (add or subtract credit hours), add new classes, adjust required classes vs. electives, for the conversion of our 2 year Landscape Certificates to AASO degrees. That conversion took place this fall and winter terms, and now we have three AASO degrees in Landscape Design, Landscape Construction and Landscape Management. The new plan for assessment has helped us assess each of these areas more thoroughly than the previous plan. Along with the revised plan, we submitted 4 rubrics to be used in key classes for grading of the student projects. Each rubric (or slight variation) was used within the time frame submitted with the plan, as each class was completed. After the grading was complete, the entire fulltime faculty took time to "norm" the results for each class. This process has lead to a better overall plan for assessment with promise of developing it into a useful tool for the department. We will use it as a baseline to compare the achievement of skills of first year students with graduates that walk out the door. Once we know what skills are being attained in the first year, we will have a better idea of how to improve upon and fill in the gaps before they graduate.

For each outcome assessed this year:

2. Describe the assessment design (tool and processes) used. Include relevant information about:
   - The nature of the assessment (e.g., written work, project, portfolio, exam, survey, performance etc.) and if it is direct (assesses evidence mastery of outcomes) or indirect (student's perception of mastery). Please give rationale for indirect assessments (direct assessments are preferable).
   - The student sample assessed (including sample size relative to the targeted student population for the assessment activity) process and rationale for selection of the student sample. Why was this group of students and/or courses chosen?
   - Any rubrics, checklists, surveys or other tools that were used to evaluate the student work. (Please include with your report). Where appropriate, identify benchmarks.

- How you analyzed results, including steps taken to ensure that results are reliable (consistent from one evaluator to another.

Outcome 1 - Graduates should function as competent landscape professionals in their chosen area of the landscape industry whether it's landscape construction, maintenance, or design.

For Landscape Construction:

In LAT 111 - Landscape Construction Practices classes – individual portfolios were used for assessment and a rubric was constructed for grading the final project. The project contained both direct and indirect assessment of skills. Rationale for indirect assessment is contained in project outline. Project outline and rubric are attached.

Sample size was for two sections of this class, comprising 27 students out of a total of 75 Landscape Technology AAS students, and 1 Landscape Construction Certificate student (Banner data, as of spring, 2012). They are all considered first term, first year students, however many students do not take classes in a specific order. Also, many of our students (about a third) come from industry and may have quite a bit of knowledge pertaining to any one particular class they may encounter in the program. For our purposes, most students in these two sections would be considered beginners, and therefore appropriate for assessment of basic landscape construction skills and outcomes. In the future, we would like to use this assessment as a baseline for evaluating landscape construction graduates in their last year of the program.

After the instructor evaluated individual projects, the projects and grade sheets were laid out and further normed into groups of A's, B's, C's, etc. by the entire fulltime faculty. Discussion of grading practices, various graded results and regrouping lead to further discussion on the objectives achieved by the project and why students ended up as they did.

For Landscape Design:

In HOR 290 – Introduction to Landscape Design class – Individual final projects were used for assessment and a rubric was complied for grading the final project. The project contained direct assessment of skills only. Project outline and rubric are attached. For this project, students are asked to complete a landscape design for a real client, and follow the steps of design from the initial site visit, taking measurements of the property, drawing up a base map of the site, and drawing a design that includes all the necessary detail for installation. One student's design is selected for installation, and the entire class goes to the site and installs the project towards the end of the term.

Sample size was for one section (out of two) for this class, comprising 20 students out of a total of 75 LAT AAS students, and 17 Landscape Design Certificate students (Banner data, as of spring, 2012). They are all considered second term, first year students, however many students do not take classes in a specific order. Also, some students may have been developing skills through self-study of design, or could have prior background and/or skills, such as drafting, that come from other similar professions. For our purposes, most students in this section would be considered beginners, and therefore appropriate for assessment of basic landscape design skills and outcomes. In the future, we would like to use this assessment as a baseline for evaluating landscape design graduates in their last quarter of the program. That assessment will come from the LAT 280 CE: Landscape Design class which has only a few students during a term, but has comprehensive outcomes to evaluate students. Comparison of a beginning class with future graduates would point out major holes and program inconsistencies, leading to improvement of technique, design practices and emphasis of key skills in the program.

The three full-time LAT faculty got together to norm the grading, by evaluating each project and discussing where each project falls on the rubric. The discussion was quite productive and led to much helpful dialog about the rubric and how to gauge each project. Where we disagreed, we were able to discuss our reasoning and come to eventual agreement. This exercise was very helpful in guaranteeing that grading is

even-handed across the program, and that students in one class are not treated more harshly than another.

For Landscape Management:

In LAT 110 – Grounds Maintenance classes – Typically, this class has a final project consisting of individual Maintenance Calendar geared specifically to the Pacific Northwest region. Due to the NSF grant and subsequent release of the fulltime faculty (who usually teaches this class), and the new part-time instructor (currently teaching two sections of this class for the firs t time ever); it was decided that this would be a poor time to evaluate the outcomes. The project would be direct assessment of student skills as in the past. A rubric was made up and submitted previously (see attached). It will need to be reworked for next year as the scope of the class and the project itself has dramatically changed. Evaluation from past performance of students completing the previous year's project was reason enough to completely overhaul the current project. Discussion between current and past instructors has occurred this spring and will continue to update the project, class and rubric for 2012-13. Norming of projects would be consistent with descriptions in the above paragraphs.

Outcome 2 - Demonstrate knowledge to obtain and maintain certification and/or licensing required for their chosen field as prescribed by local, state or national organizations or associations.

As stated in our initial plan, we evaluated this outcome and decided that it wasn't valid considering licensing and certification for landscape design, landscape management and even landscape construction are currently optional, although recommended and certainly valued in the industry. Our new AASO degrees have dropped this outcome completely in favor of assessable outcomes that are needed by our students upon graduation.

Outcome 3 / Outcome 4

- Communicate effectively using verbal, written and/or graphic skills, individually or as a member of a team, to listen and relate with clients and coworkers of diverse cultures and backgrounds in a professional manner.
- Develop sensitivity toward current environmental and sustainable issues as they directly impact the landscape industry, and be able to assess and change practices to align with cultivating care for the earth.

For Landscape Design, Landscape Construction and Landscape Management:

In CSS 200 – Soils and Plant Nutrition classes – group projects were used for direct assessment of outcomes 3 and 4 above. The project consisted of testing soils, recording results, compiling data, analyzing existing soil conditions, making recommendations on fertilization and Best Management Practices (BMP's) for improving soils (see attached project sheet). They present their results, analysis and recommendations to the class verbally, using a variety of visuals, and also put together a written report graded by the instructor. A rubric was developed for grading the project. See attached rubric and project sheet.

Sample size was for two sections of this class, comprising 35 students out of a total of 75 Landscape Technology AAS students (Banner data, as of spring, 2012). Group work was done in teams of 4-5 students per group, 4 groups/class, and 8 presentations/reports completed in total. They are all considered second term, first year students, however many students do not take classes in a specific order. Also, many of our students (about a third) come from industry and may have quite a bit of knowledge pertaining to soils that they have picked up through self-study, through outside classes (environmental science) or industry experience. For our purposes, most students in these two sections would be considered beginners, and therefore appropriate for assessment of basic understanding of soils and plant nutrition. They all have an affinity toward sustainable practices and many share experiences within the classroom that broaden student's perspective, including the instructor's. This class was picked because it is required of all students

in the LAT program, the subject matter has a direct impact on environmental and sustainable issues, and the project contains individual and team work, a variety of communication skills, and critical thinking. While this is usually taken at the middle of their first year, it is a good introduction to all the skills needed for them to be effective landscape professionals.

3. Provide information about the results (i.e., what did you learn about how well students are meeting the outcomes)?
   - If scored (e.g., if a rubric or other scaled tool is used), please report the data, and relate to any appropriate benchmarks.
   - Results should be broken down in a way that is meaningful and useful for making improvements to teaching/learning. Please show those specific results.

For Landscape Construction:

The portfolios were a solid measure of student's understanding of the most common tools, equipment, materials and techniques used for landscape construction. More importantly, students provided evidence that they could appropriately and safely combine these resources into an actual project instead of just approaching them as individual topics or categories. The reflection portion of the portfolios was particularly helpful in giving students a chance to link their learning to other experiences and things they have learned in other classes.

My overall impression from the results was that students walked away with a solid foundation of knowledge and hands-on skills i.e. they achieved the outcomes of the class. Because we have already been making changes to the curriculum and class organization, I see the results less as a "these are the weaknesses and here's what we need to change" and more of "the results are a confirmation that the changes we've implemented over the past two years are working well to meet the learning objectives of the class".

The "weakness" in the project was on the assignment and assessment end, and I have already made changes to the 2012 classes in response. Based on results and student feedback, I have adjusted the reflection portion of the assignment to be a bit more defined and to encompass all of the topics together instead of individually. On the assessment end, I have redesigned the rubric to directly measure the student's understanding of the tools, equipment, materials etc. that they chose to include in their portfolio.

For Landscape Design:

After evaluating the projects, it became apparent that certain weaknesses were common. In particular, the title block was an area of weakness. This is clearly an area that needs more explanation in class so that students understand what is expected. This will be changed so that a handout is provided to the students showing the exact expectations, in addition to more explanation during class.

Other weak areas included the selection of plant materials and the creativity/simplicity balance. This is a difficult concept to get across to beginning students; however, this can be addressed during the one-on-one student-teacher conferences that are held at various points during the class. More discussion of this will also be added to the lecture time. In addition, walk-around discussions on campus could be held to actually look at plant spacing and creativity, and have students reflect on how to achieve that balance.

For Landscape Management:

Due to the circumstances of having a brand new teacher for this course, a modified project from the previous year, and ultimately an outdated rubric, this evaluation was scrapped from the outset. We will

work together to have a better project, rubric, norming, recorded results and analysis in place for next year's assessment of the management part of our program.
These comments were made by the current instructor: "My hope for the project was to take the concepts of the class and with further research on their own, to apply specific care principles to their own specific project. A few of the students really embraced the project and produced wonderful working documents that really brought all of the concepts of the class together as I had hoped. The majority of students cobbled calendars together that met the requirements, but really didn't get to that place of true application or understanding. Many of the projects were patchwork cut and paste documents. Some of that blame lies with me and my understating the goal or expectations, I think. Now having been through the drill once--I would better be able to revise, rewrite and present the project for another year."

For Soils and Plant Nutrition:

Strengths observed: What is consistently seen in this class is a greater understanding of the why's and how's of soil testing. Good record keeping and presentation of results. Good work with compiling data, and reporting on what's there in soils. Written presentation of the facts, recommendations and conclusions are usually - very good to good. Visually most students produce - good - presentations. Overall with the given constraints of this project, I always am amazed with the quality of work that is completed in the time allotted.

Weaknesses observed: Harder for students are the recommendations for fertilization of soils. This takes math calculations, and considerable reading of extension publications, which admittedly takes awhile to navigate through the material and digest before true understanding. Some are quite competent, but others are developing and struggle. This often shows with a mix on individual final exams.

Also, while Best Management Practice (BMP's) are easier for students to understand, often their critical thinking skills are not developed enough to make excellent recommendations and feel confident in their ability to make those decisions. Often, even while students are doing group presentations, I see students take the work they've thought through and change it, because another group came up a different way of thinking or recommendation. If they were critically thinking about BMP's they wouldn't jump to the conclusion that the other group is right, and they are wrong. They are in the beginning of their education in the LAT program; I expect their skills at critical thinking are at best developing or average for now.

Where I see the least amount of communication skill is in their verbal presentations to the class. Because of time constraints they often read, rather than present their findings. Also for some students, they should be encouraged to print, proofread, and correct their written report before handing in.

4. Identify any changes that should, as a result of this assessment, be implemented to help improve students' attainment of outcomes. (These may include, but are not limited to, changes in curriculum, content, materials, instruction, pedagogy etc).

For Landscape Construction:

In response to the results and our norming process the instructor has rewritten and improved the portfolio assignment and rubric. Specifically, the rubric has been adjusted to better emphasize evaluation of the skills being tested, rather than the production of a portfolio. The new model will be implemented this year, Fall term, 2011 in LAT 111 (2 sessions) and LAT 211. Attached are the new 2012 portfolio assignment and rubric.

For Landscape Design:

The title block is clearly an area that needs more explanation in class so that students understand what is expected. This will be changed so that a handout is provided to the students showing the exact expectations, in addition to more explanation during class.

Regarding plant selection and the balance of creativity vs. simplicity: This can be addressed during the one-on-one student-teacher conferences that are held at various points during the class. More discussion of this will also be added to the lecture time. In addition, walk-around discussions on campus could be held to actually look at plant spacing and creativity, and have students reflect on how to achieve that balance.

For Landscape Management:

Attached are the new project assignment and reworked rubric used for this year, 2012 - evidence that we are developing this curriculum as we write. Also, copies of the grading rubrics were kept for tallying and comparison, with hopes of guidance for obtaining good student outcomes for this class in the future. Previous and current instructor will be meeting this summer to further look at the results and continue the dialog on revising the course to meet objectives.

For Soils and Plant Nutrition:

One improvement that has already been changed and slated to be implemented, is greater credit hours for the class (from 3 to 4 credits). This will allow more time for lab, to practice math skills, to digest the material, and for group project meetings. Overall that will ease up the time constraint and resultant "time crunch" that is always felt and observed in this class. Emphasize more care in written skills (proofreading) and verbal skills (practice) for the project. It would be great to develop a sheet on Presentation tips for students that they could use it to polish their skills in this class, and others in the program. Reworking the project criteria slightly and the rubric to reflect that will be done. Also, develop the rubric to assess the listed outcomes better (beyond the grade) will be done.

5. Reflect on the effectiveness of this assessment tool and assessment process. Please describe any changes to assessment methodology that would lead to more meaningful results if this assessment were to be repeated (or adapted to another outcome). Is there a different kind of assessment tool or process that the SAC would like to use for this outcome in the future? If the assessment tool and processes does not need to be revised, please indicate this.

   We learned mostly … we are learning how to do assessment that is meaningful. We had some successes this year. Classes were identified in the three areas of the program to assess for Outcome #1. Outcome #2 was re-evaluated for its importance to the AAS, its ability to be evaluated, and eventually decided to exclude it from the new outcomes for the AAS degrees. Projects were identified in the basic core classes where student numbers are greater, thus making the assessment data more valid. A project for Outcome #3 and #4 was selected because it fits the outcomes well and builds college core outcome skills for our students. We took time to put rubrics together, specific to selected projects; some teachers had done this before, to others, it was a new process. In the process of norming we found out different methods teachers used to assess student work, what objectives are important to us all, and the various interpretations of objectives that individual instructors can make. We have made individual progress toward improving the assessment tool (rubrics) to provide information valuable for grading, as well as valuable for assessment of outcomes.

   Things that need to be done in the future to improve effective assessment: Tally up results on the rubric score sheets for hard data, rather than using anecdotal evidence for making constructive change. Make informed decisions on program changes based on the data recorded. And as stated before, it would be nice for assessment purposes to develop a second set assessments for graduating students for comparison with our first year students.

   Respectfully submitted,
   Marilyn Alexander, Landscape Technology SAC Chair

Soils and Plant Nutrition Project Rubric	Excellent (5)	Satisfactory (3)	Benchmark (1)
Report Title Page & Authors	Contains report title, names of group members, date, course, section, and instructor name.	One to two entries missing except report title and group names.	Missing more than 2 entries, or report title or group names.
Description of Site and Map	Contains general site information; location, topography, orientation, drainage, construction issues, with a color coded map showing location of SMU's. (Location of off campus SMU's noted and mapped.)	One to two categories missing, inclusion of color coded map showing location of SMU's. (Location of off campus SMU's noted and mapped.).	More than two categories missing or color coded map not included.
SMU - Rationale for Soil Mgt Units	Complete description of individual SMU's, with rationale noting the differences for each in topography, texture, or plant material. 3-5 SMU's included.	Incomplete description of one to two SMU's, or rationales not noted, or two SMU's similar. 3-5 SMU's included.	Three or more descriptions of SMU's incomplete, or rationales not noted, or less than 3 SMU's submitted.
SMU - Description of Soil (physical properties)	Complete description of consistency and color using terms discussed in class. Munsell chart designations included.	Descriptions unclear, or non-typical terms used for consistency and color, or lacking Munsell chart designations.	Descriptions unclear, or non-typical terms used for consistency and color, and lacking Munsell chart designations.
SMU - Soil Test Results (texture, humus, pH, N, P, K, Ca, and Mg)	Complete table of test results including: texture (%'s of sand, silt, and clay and textural classification); humus #; pH #; N-P-K (lbs/a & ppm); Ca-Mg (ppm & meq) for each SMU.	Incomplete table of test results missing one to two entries for each SMU.	Incomplete table of test results missing three or more entries for each SMU.
SMU - Recommendations for Soil Fertilization	Complete calculations for type of fertilizer or amendment, fertilizer ratio, fertilization rate (pounds / 1000 square foot), frequency per year and when to apply, actual pounds of fertilizer / application for area in each SMU.	Incomplete calculations for one to two SMU's	
SMU - Recommendations for Soil Management	Complete, thoughtful and insightful recommendations, regarding soil organisms, mulch, avoiding compaction, etc. for each SMU included.	Complete recommendations for each SMU included as discussed in class	Incomplete recommendations for each SMU.
Conclusion	Describes sustainable or best management practices (BMP's) to employ for protection, correction, and improvement of soils and management of site overall.	Summary reiterates recommendations above for specific SMU's, and only adds one to two comments for sustainable practices or BMP's overall.	Summary reiterates recommendations above for specific SMU's with no comment on sustainable practices or BMP's overall or summary not included.

LAT 110 – Grounds Maintenance

Course Project 2012

Final Grounds Maintenance Calendar

General description: For this project you will be developing a landscape maintenance calendar for a residential or commercial property. It is a guideline, in list format, to remind you of the routine and regular care for a site.

Options for case-studies include:

- An existing maintenance account that you might have
- A garden that you are designing
- Your own personal garden
- A prototype garden that you hope to develop maintenance services. Some examples of possible scenarios:

Residential Sustainable Landscape Maintenance - You are to maintain the site in a well groomed condition but are to follow sustainability practices where practical. You can find a guide to sustainable landscape practices at the following website (though you may use any resource that you like): http://www.sustland.umn.edu/ . Your crew visits the site weekly during the mowing season.

Commercial landscape maintenance - You are to maintain the site in a well groomed condition. Cost-effective and efficient practices are the key operating philosophies. Your crew visits the site weekly during the mowing season.

Estate gardener - You are to maintain the site in a well groomed condition. You are the sole maintenance person and you have a limited operating budget. Appearance and color are important to your employer. You are there every day (except Christmas and Thanksgiving).

Minimum requirements:

- Minimum 20 different types of plants to include a minimum of 3 trees species to include 1 conifer, 5 shrub species and 5 different annuals/perennials.

- Minimum 1000 sq ft lawn, lawn alternative or vegetable garden.

Parameters: This project is to be a well-organized, professional and thoughtful document. The calendar is to be presented as if it were an annual report to the client/employer of what you will be doing in the coming year. It may be compiled in a notebook or binder or submitted electronically. The document must be typed, 12 point font (minimum) and have page numbers. Use this course requirement as an opportunity to develop a document that you could utilize for your own property or proudly hand over to potential clients, crew members or industry professionals.

Include the following items in the order presented:

1. Title Page: title, project/client name, location, your name, date

2. Letter of Intent or Summary of the scope of the project and the philosophy behind your maintenance approach (mission statement, guiding principles or stated aims, frequency of visits)

3. Table of contents

4. Detailed Inspection Report to included full list of plants (botanical and common names)

5. Arial map or sketch of property to include utilities, hardscapes, trees, shrubs and flower beds. Can be divided into zones.

6. Month by month calendar: Use a separate page for every month and break activities down

   For each Calendar Month:

   - One page minimum – have the tasks listed in an outline format under headings such as Turf, Planting, Pruning, Weed Control, etc.

   - Indicate how often the task will be performed –
     Special Activities (things that are done only a couple times per year)
     Monthly (things that are done on a once or twice per month basis)
     Weekly (done on a weekly basis)
     Daily or Per Visit (done on a daily or a per visit basis)

   - **Include pruning, fertilization and other care requirements for your specific landscape materials** (when to prune and how much, when to fertilize and how much, monitoring for specific pest, etc)

   - Have specific information on types of chemicals/chemical alternatives used (pre-emergent vs. post-emergent, selective vs non-selective, granular vs spray, or specify chemical alternatives), recommended application rates, and placement for fertilizers and chemicals. (You can find suggested rates online and actual label instructions).

   - If brief instructions are needed for crews, include them. Presumably they will have been trained, but not necessarily.

   - Include all general maintenance tasks for your landscape.

Grading: The project will be evaluated on the following criteria:

Presentation quality (sharp, neat, professional looking)	_____ / 10
Does it meet your emphasis?	_____ / 10
Thoroughness (Does it contain all the activities necessary?)	_____ / 50
Quality (Are the entries well defined? Can someone else take this calendar and be able to follow it?)	_____ / 30
TOTAL POINTS:	_____ / 100

DUE: At the beginning of class on June 4 (PM) and June 7 (AM), 2012 – Week 10

Landscape Construction Practices I – Portfolio

General description: To document and assess what you learn in the lab portion of Landscape Construction Practices I, each student will create a portfolio of their work. If done appropriately, your portfolio will be a valuable document you can use to demonstrate your experience, knowledge and skills to potential employers or clients.

Formatting your portfolio: The portfolio must be created and submitted electronically (Word document or PDF). Pages are to be typed, 12-point font, single spaced and have no greater than 1-inch margins. The narrative portions of the document are to be written in complete sentences. Spelling and grammar do count. Each section needs to be introduced by a divider page. For example, after the "Core Projects" section you need to insert a page that simply says "Tools" that lets the reader know it is the beginning of a new section. See the example at the end of this document.

Your portfolio must follow the outline below:

1. *Title page* (your name, title of the project, date, course)

2. *Core projects (techniques)*: For this portion of the portfolio, the student will choose any 3 of the 5 core projects we do in the class (e.g. installing pavers, installing gravel paths, installing precast block walls, wood construction, forming and pouring concrete). For each of the three selections, the student will create a chronological record of how the project was accomplished from start to finish. Each entry must include at least 3 high quality photos or diagrams that are referenced in and enhance the text. Each entry is not to exceed 3 pages.

3. *Tools (hand tools or electrical power tools)*: For this portion of the portfolio, the student will choose any 6 tools (2 must be electric power tools) we use during our projects that are relatively new to them (e.g. spade, rubber mallet, circular saw, speed square, laser level, wheel barrow, drill,). Each page (one page per tool) should include:
    a. one or two photographs or diagrams demonstrating how the tool is used
    b. a description of the tool and how it is used
    c. safety precautions associated with use of the tool

4. *Equipment (gas powered)*: For this portion of the portfolio, the student will choose any 2 pieces of equipment we use during our projects (e.g. compact utility loader, skid steer loader, tractor, wet saw, plate compactor). Each page (one page per piece of equipment) should include:
    a. one or two photographs or diagrams demonstrating how the equipment is used
    b. a description of the equipment and how it is used
    c. safety precautions associated with use of the equipment

5. *Materials*: For this portion of the portfolio, the student will choose any 3 materials we use during our projects (e.g. ¾ minus gravel, ¼ minus gravel, pavers, geotextile fabric, lumber, wood fasteners, concrete, precast wall blocks). Each page (one page per material) should include:
    a. one or two photographs or diagrams demonstrating how the material is used
    b. a description of the material and how it is used
    c. safety precautions associated with use of the material

6. *Reflection*: For this portion of the portfolio, the student will reflect on the entries in their portfolio and the experience gained in the course, and then list and discuss the three most important things they learned from the lab section of the class. This section is to be one to two pages in length. Some questions to consider in your discussion might include:
    a. Why are these things most important to you?
    b. How is what you learned connected to other courses?
    c. How is what you learned connected to other experiences?
    d. What do you need to know next?
    e. What's the value of this knowledge?
    f. How do you think you might use this knowledge in the future?
    g. Can you build on, increase or otherwise improve this knowledge?

Submitting the portfolio

The portfolio must be completed as a single Word document or PDF file and submitted by 5:00 p.m. on Friday December 7th in the appropriate "Portfolio" folder for your class section under "Dropbox" on your D2L site for this class. Your document must be titled as "daywemeet.YourName" with no spaces. For example, "Tuesday.BrianJones".

Hints!

1) Avoid "lamination". This is the tendency to focus so much on polish, that the project ends up with very little substance i.e all sizzle and no steak.
2) **Do this project as you go!** Waiting to the last week will be an overwhelming amount of work. You'll be very unhappy with it and you won't be learning or reinforcing anything as you desperately try to cram it together. I will be happy to review your portfolio with you at any time during the term to make sure you are on the right track.
3) Include yourself as the subject in your photographs as evidence that you actually did the techniques and used the tools, equipment and materials in your portfolio.
4) Cameras are available to be checked out from the PCC Rock Creek Library.
5) Start a "photobucket" site where everyone can download and share photos.

Grading Rubric for Landscape Construction Portfolios

(Numbers in parentheses represent the maximum potential point value per box.)

	Does not meet category requirements	**Meets few category requirements**	**Meets some category requirements**	**Meets most category requirements**	**Meets category requirements**	Score
Completeness (30)	* 10 or fewer entries (10)	11 entries (15)	12 entries (20)	13 entries (25)	14 entries (30)	
Organization, formatting and professionalism (10)	Not organized, formatted and neat (2)	Minimally organized, formatted and neat (4)	Partially organized, formatted and neat (6)	Mostly organized, formatted and neat (8)	Organized, formatted and neat (10)	
Techniques (10)	Does not demonstrate understanding of the techniques included (2)	Demonstrates minimal understanding of the techniques included (4)	Demonstrates some understanding of the techniques included (6)	Demonstrates significant understanding of the techniques included (8)	Demonstrates thorough understanding of the techniques included (10)	
Tools (10)	Does not demonstrate understanding of the tools included (2)	Demonstrates minimal understanding of the tools included (4)	Demonstrates some understanding of the tools included (6)	Demonstrates significant understanding of the tools included (8)	Demonstrates thorough understanding of the tools included (10)	
Equipment (10)	Does not demonstrate understanding of the equipment included (2)	Demonstrates minimal understanding of the equipment included (4)	Demonstrates some understanding of the equipment included (6)	Demonstrates significant understanding of the equipment included (8)	Demonstrates thorough understanding of the equipment included (10)	
Materials (10)	Does not demonstrate understanding of the materials included (2)	Demonstrates minimal understanding of the materials included (4)	Demonstrates some understanding of the materials included (6)	Demonstrates significant understanding of the materials included (8)	Demonstrates thorough understanding of the materials included (10)	
Reflection (20)	Reflection is not thoughtful and relevant (4)	Reflection is minimally thoughtful and relevant (8)	Reflection is somewhat thoughtful and relevant (12)	Reflection is mostly thoughtful and relevant (16)	Reflection is thoughtful and relevant (20)	
					TOTAL	

* The grade for portfolios with fewer than 10 entries will be adjusted based on the percentage complete.

TITLE OF YOUR PORTFOLIO

YOUR NAME

THE DATE

LAT 111

FALL 2012

CORE PROJECTS

INSTALLING PAVERS

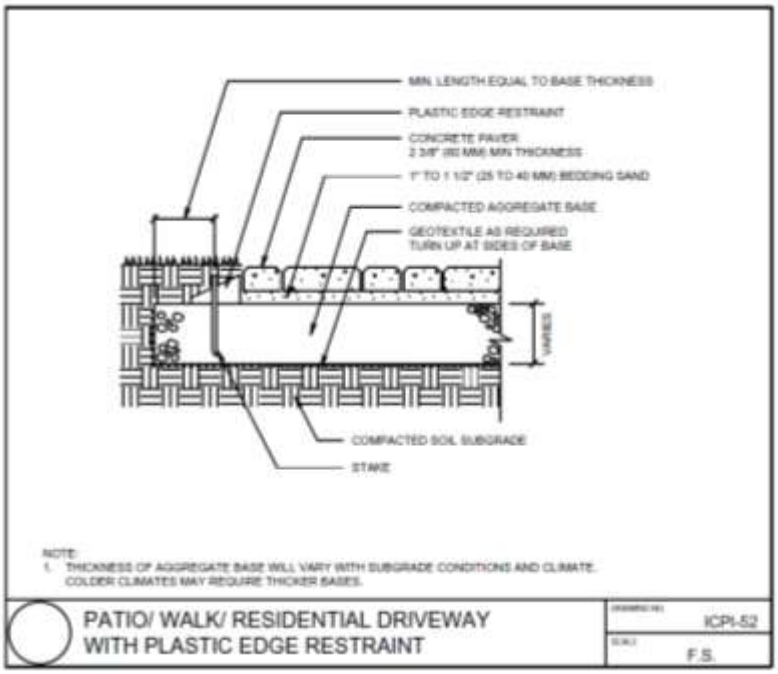

Figure 1. Typical paver specification.

1) Layout the project with flags, strings and marking paint.

2) Calculate excavation depth. Total depth should equal: depth of paver + depth of bedding sand + depth of base – (1/4 to 1/8”). The final paver height (before compaction) should be ¼ to 1/8 inch above final grade (Figure 1).

3) Excavate beyond the outer edge of the pavers by at least the depth of the base (spike to edge of base). Achieve rough slope now if necessary.

4) Compact sub-grade if necessary with a plate compactor.

5) Install geotextile fabric. Overlap joints by 12 to 18 inches. Come up the sides.

6) Install base (3/4 minus gravel) in 2 inch lifts (4 inch base for typical residential foot traffic). Add water if necessary to optimize compaction. Compact and rake. Check grade and slope (ICPI recommends within 3/8 inch “evenness”).

7) Temporarily (partially spiked) install 1 or 2 (for corners) edge restraint pieces by putting in 1 spike every 2-3 feet.

8) Install bedding sand (approximately 1 inch of coarse builder’s sand; Figure 1) by first laying down the screed rails and then covering them with sand so they don’t move. Next lay in the sand. Screed with a board or rake and then trowel for finishing work.

Lift the screed rails carefully and fill the holes with sand and trowel smooth (Figure 2). Only sand and screed the area(s) to be covered with pavers that day.

Figure 2. Finishing the sand bed.

9) Lay pavers starting with the soldier course on a string line. For square projects you can start in a corner. Next install the body pavers. Consider adjusting size/pattern to minimize cutting. Constantly check bond lines with string. Cut individual body pavers as needed. Finish opposite soldier course. Install final edge restraint.

10) Fill edges of the project with soil or base material.

11) Fill any spaces between edge restraint and soldier course with sand.

12) Run plate compactor over the project, working from the outside in. This settles and levels the pavers and begins moving bedding sand up between pavers to initiate interlock.

Figure 3. Sweeping sand.

Figure 4. Sand piled on pavers.

13) Fill joints with dry, coarse concrete sand by sweeping diagonal to bond lines (Figures 3 and 4).

14) Repeat plate compactor (Figure 5). Sweep and compact until all joints are full (putty knife to check).

Figure 5. Finishing with the plate compactor.

15) Cut away excess geotextile fabric (torch for small pieces/edges).

16) Fill project edges with soil and bring to finish grade.

TOOLS

CIRCULAR SAW

Figure 1. Making a crosscut with a circular saw.

Figure 2. Circular saw.

Description of the tool and how it is used:

The circular saw is one of the most used tools in outdoor wood construction. They are generally electric (corded or battery operated). They are most often used for cutting wood (Figure 1), but can be fitted with blades to cut metal and even stone. Circular saws have a handle and trigger on top of the saw, a spinning, toothed blade, a blade guard that adjusts to the depth of the cut and a foot plate that adjusts up and down to regulate the depth of the cut and rotates around the axis of the blade to allow bevel cuts. When making cuts, the operator should make sure that the heaviest part of the saw (usually the left side) rests on the portion of the wood that is being kept. This is to insure support of the saw throughout the cut. Always make sure you have two hands on the saw at all times while you're making a cut.

Safety precautions:

Wear eye and ear protection and a dust mask if you are cutting in an enclosed area. Make sure you've reviewed all of the safety precautions for the saw. Never make adjustments to the saw while it is plugged in. Insure that all bolts are tight, especially the one holding the blade on. Make sure blade guard is operating properly. Make sure blade is sharp and clean. Get in good position – well balanced on both feet, both hands on the saw and to the side of the cut – not directly behind the saw so that if kickback occurs it doesn't hit you directly in the head. Kickback occurs whenever the saw blade binds in the wood (particularly at the back of the blade). The binding causes the saw to jump out of the kerf (back at the operator) quickly and sometimes violently. Binding may be caused by unsupported wood that falls in as it is cut or pinches forward as it is cut, knots, nails or other inconsistencies in the wood, twisting wood, trying to turn while cutting or a dull blade.

LAT 111 Portfolio

General description:
A portfolio is a collection of student work samples (e.g. writings, drawings, photos, videos) and some form of reflection by the student upon that work. These may be hard copies or electronic (a three-ring binder, notebook, CD, USB drive, web site). The portfolio will tell a coherent story of what you have learned in this class and be a collection of work that you could show a future employer to demonstrate your experience and/or competency with various landscape construction tools, materials and skills. Each entry will consist of two parts: 1) student work samples and 2) reflection about those work samples. This has to be a polished document that you would be proud to hand to an industry professional as a representation of your best work.

Student work samples:
Samples you choose to include need to demonstrate that you have learned something. Choose these wisely. These may be writings, drawings, photos or videos. These must be clear, high quality and professional. Each sample must be accompanied by a caption briefly explaining the sample. It may be helpful to work with others during the term to insure that evidence is being recorded.

Reflection:
The reflection portion of your portfolio demonstrates that you have thought about what you have learned or experienced. It must be written in complete sentences with proper grammar and spelling. Some questions to answer in this section may include:

- Why did you choose this example of your work?
- What is the significance of this example?
- Why is this example important to your learning?
- What did you learn in this example?
- How is what you learned connected to other courses?
- How is what you learned connected to other experiences?
- What do you need to know next?
- What's the value of this knowledge?
- How do you think you might use this knowledge in the future?
- Can you build on, increase or otherwise improve this knowledge?

Categories:
Your portfolio must include 4 of the 5 following projects. These are the major course projects. Each entry requires a minimum of one page of evidence and two pages (typed, single-spaced, 12 point font) of reflection.

- Installing pavers
- Installing gravel paths
- Installing precast block walls
- Wood construction
- Forming and pouring concrete

Your portfolio must include 2 of the following items. These are general knowledge items from throughout the term. Each entry requires a minimum of one page of evidence and one page (typed, single-spaced, 12 point font) of reflection.

- Landscape construction and safety items (e.g. safe lifting)
- Forming a square corner with a 3, 4, 5 triangle
- Landscape construction and building codes
- Project phasing

Your portfolio must include 4 of the following items. These are tools and equipment items from throughout the term. Each entry requires a minimum of one page of evidence and one page (typed, single-spaced, 12 point font) of reflection.

- Compact utility loader
- Tractor
- Skid-steer loader
- Plate compactor
- Laser level
- Circular saw
- Drill
- Wet saw (brick saw)
- Hand tools for landscape construction

Your portfolio must include 4 of the following items. These are materials items from throughout the term. Each entry requires a minimum of one page of evidence and one page (typed, single-spaced, 12 point font) of reflection.

- Materials for building walls
- Materials for paver installation
- Types of pavers
- Materials for gravel paths
- Selecting lumber
- Wood fasteners

Organization:

I. Title page (name & contact information)
II. Major projects (4)
III. General knowledge (2)
IV. Landscape equipment (4)
V. Landscape materials (4)

Note: Each entry must clearly state what the item is at the beginning of the entry. (e.g. “Types of Pavers”)

Grading:

Portfolios will be assessed on the following criteria with the associated point values.
Portfolio is complete with all 14 entries (40)
Portfolio is organized per the portfolio description handout (10)
Portfolio is neat, clean, professional (grammar, spelling) and ready to present to anyone in the industry (10)
Evidence is informative and well selected (20)
Reflection is thoughtful and answers the questions presented (20)

WARNING!

1) Avoid “lamination”. This is the tendency to focus so much on polish, that the project ends up with very little substance i.e all sizzle and no steak.
2) Do this project as you go. Waiting to the last week will be an overwhelming amount of work. I will be happy to review your portfolio with you at any time during the term to make sure you are on the right track.

Introduction to Landscape Design Project Grading Rubric

Category	1) Does not meet requirements	3)Meets Requirements	5) Exceeds Requirements
Neatness, General Appearance	Project is messy, with many smudges. Paper torn or crinkled. Not professional looking.	Project is mostly neat, clean and professional looking, with minimal smudging of lines.	Project is neat, clean, and professional-looking. No smudging of lines.
Title Block	Many elements missing (Client name, Address, Designer name, Date, Sheet number, graphic scale, north arrow)	Missing one or two elements (Client name, Address, Designer name, Date, Sheet number, graphic scale, north arrow)	All elements included (Client name, Address, Designer name, Date, Sheet number, graphic scale, north arrow)
Lettering and Labeling	Lettering and labeling is not neat and readable. Many elements are not labeled. No guidelines used.	Lettering and labeling is mostly neat and readable. One or two elements are not labeled. Guidelines or vertical guides not used.	Lettering and labeling is neat and readable. All elements are labeled. Guidelines and/or vertical guides are used when appropriate.
Symbols	Symbols for deciduous trees, shrubs, conifers and groundcovers are inappropriate or show no variation. Symbols are indistinct and hard to interpret.	Symbols for deciduous trees, shrubs, conifers and groundcovers are mostly appropriate. Symbols are generally clear, but may be indistinct in places.	Appropriate symbols for deciduous trees and shrubs, conifers, and groundcovers are used. Symbols are clear and distinct.
Plant selection	Plants are generally not appropriate for the site and conditions. Plants may be an inappropriate size in 5-10 years.	Plants are generally appropriate for the site and conditions, with some exceptions.	Plants are appropriate for the site and conditions. They will be appropriate in size in 5-10 years.
Creativity and functionality	The plan is not functional. The plan shows little or no creativity and little or no functionality.	The plan is functional. It shows some creativity.	The plan is functional. Circulation has been addressed. It shows balance, proportion, and unity. It shows a good balance between creativity and functionality.
Written rationale	The design intent is	Expresses the intent	Expresses the intent of the

	unclear.	of the design in very basic terms.	design in a clear, compelling way.
Plant list	Missing most names, sizes or quantities	May be missing some names, sizes or quantities	All scientific names, sizes, and quantities are listed

Grading Rubric for Landscape Construction Portfolios

(Numbers in parentheses represent the maximum potential point value per box.)

	Does not meet category requirements	**Meets few category requirements**	**Meets some category requirements**	**Meets most category requirements**	**Meets category requirements**	Score
Completeness (30)	* 10 or fewer entries (10)	11 entries (15)	12 entries (20)	13 entries (25)	14 entries (30)	
Organization, formatting and professionalism (10)	Not organized, formatted and neat (2)	Minimally organized, formatted and neat (4)	Partially organized, formatted and neat (6)	Mostly organized, formatted and neat (8)	Organized, formatted and neat (10)	
Techniques (10)	Does not demonstrate understanding of the techniques included (2)	Demonstrates minimal understanding of the techniques included (4)	Demonstrates some understanding of the techniques included (6)	Demonstrates significant understanding of the techniques included (8)	Demonstrates thorough understanding of the techniques included (10)	
Tools (10)	Does not demonstrate understanding of the tools included (2)	Demonstrates minimal understanding of the tools included (4)	Demonstrates some understanding of the tools included (6)	Demonstrates significant understanding of the tools included (8)	Demonstrates thorough understanding of the tools included (10)	
Equipment (10)	Does not demonstrate understanding of the equipment included (2)	Demonstrates minimal understanding of the equipment included (4)	Demonstrates some understanding of the equipment included (6)	Demonstrates significant understanding of the equipment included (8)	Demonstrates thorough understanding of the equipment included (10)	
Materials (10)	Does not demonstrate understanding of the materials included (2)	Demonstrates minimal understanding of the materials included (4)	Demonstrates some understanding of the materials included (6)	Demonstrates significant understanding of the materials included (8)	Demonstrates thorough understanding of the materials included (10)	
Reflection (20)	Reflection is not thoughtful and relevant (4)	Reflection is minimally thoughtful and relevant (8)	Reflection is somewhat thoughtful and relevant (12)	Reflection is mostly thoughtful and relevant (16)	Reflection is thoughtful and relevant (20)	
					TOTAL	

* The grade for portfolios with fewer than 10 entries will be adjusted based on the percentage complete.

Grading Rubric for Landscape Construction Portfolios

	Does not meet category requirements	**Meets few category requirements**	**Meets some category requirements**	**Meets most category requirements**	**Meets category requirements**	Score
Completeness (40)	0-5 entries (10)	6-11 entries (20)	12 entries (30)	13 entries (35)	14 entries (40)	
Organization (10)	Not organized per assignment (2)	Minimally organized per assignment (4)	Partially organized per assignment (6)	Mostly organized per assignment (8)	Exactly organized per assignment (10)	
Professionalism (10)	Portfolio is not neat, clean, professional (grammar, spelling) and ready to present to anyone in the industry (2)	Portfolio is minimally neat, clean, professional (grammar, spelling) and ready to present to anyone in the industry (4)	Portfolio is partially neat, clean, professional (grammar, spelling) and ready to present to anyone in the industry (6)	Portfolio is mostly neat, clean, professional (grammar, spelling) and ready to present to anyone in the industry (8)	Portfolio is neat, clean, professional (grammar, spelling) and ready to present to anyone in the industry (10)	
Evidence (20)	No evidence is informative and well selected (5)	Few pieces of evidence are informative and well selected (10)	Some evidence is informative and well selected (15)	Most evidence is informative and well selected (17)	All evidence is informative and well selected (20)	
Reflection (20)	None of the reflection is thoughtful and answers the questions presented (5)	Very little reflection is thoughtful and answers the questions presented (10)	Some of the reflection is thoughtful and answers the questions presented (15)	Most of the reflection is thoughtful and answers the questions presented (17)	All reflection is thoughtful and answers the questions presented (20)	
					Total	

Grading Rubric for Grounds Maintenance Project

Percent of Grade	**Does not meet category requirements (1)**	**Meets most category requirements (3)**	**Meets category requirements (5)**	Score
Completeness (40)	Project does not address pruning, fertilizing or soil health, integrated pest management, and shrub, tree, and/or turf maintenance for most elements in the selected landscape. Project presents a plan of action which may be missing significant amounts of information. The plan could not be implemented successfully in the landscape.	Project addresses pruning, fertilizing or soil health, integrated pest management, and shrub, tree, and/or turf maintenance for most elements in the selected landscape. Project presents a plan of action which may be missing some information. The plan could be implemented in the landscape and be largely successful.	Project correctly addresses pruning, fertilizing or soil health, integrated pest management, and shrub, tree, and/or turf maintenance for all elements in the selected landscape. Project presents a well-thought out plan of action to address all issues in the landscape. The plan could be implemented successfully in the landscape.	
Organization (10)	Not organized per assignment	Partially organized per assignment	Exactly organized per assignment	
Presentation* (10)	Delivery techniques (posture, gesture, eye contact, and vocal expressiveness) detract from the understandability of the presentation, and the speakers appear uncomfortable.	Delivery techniques (posture, gesture, eye contact, and vocal expressiveness) make the presentation interesting, and speaker appears comfortable.	Delivery techniques (posture, gesture, eye contact, and vocal expressiveness) make the presentation compelling, and speakers appear polished and confident	
Professionalism (10)	Project is not neat, clean, professional (grammar, spelling) and ready to present to anyone in the industry	Project is partially neat, clean, professional (grammar, spelling) and ready to present to anyone in the industry	Project is neat, clean, professional (grammar, spelling) and ready to present to anyone in the industry	

Evidence (20)	No evidence is informative and well selected	Some evidence is informative and well selected	All evidence is informative and well selected	
Sustainability (10)	The project shows no understanding of and sensitivity to the sustainable use of resources	The project shows some understanding of the sustainable use of resources	The project shows an understanding of and sensitivity to the sustainable use of resources	

Grading Rubric for Grounds Maintenance Project

Percent of Grade	Does not meet category requirements	Meets few category requirements	Meets some category requirements	Meets most category requirements	Meets category requirements	Score
Presentation (10)	Project is not neat, clean, professional (grammar, spelling) and ready to present to anyone in the industry (2)	Minimally neat, clean and professional (4)	Project is partially neat, clean, professional (grammar, spelling) and ready to present to anyone in the industry (6)	Mostly neat, clean and professional (8)	Project is neat, clean, professional (grammar, spelling) and ready to present to anyone in the industry (10)	
Emphasis/Intent (10)	Project fills no aims described by the letter of intent or lacks a letter of intent (2)	Project minimally fills the aims of the letter of intent (4)	Project fills some aims described by the letter of intent (6)	Project fills most aims described by the letter of intent (8)	The project meets aims outlined in the letter of intent (10)	
Thoroughness I / Entry Contents (30)	Project does not contain either of the planting requirements. (2) Project does not contain any maintenance tasks specific to the plant list. (2) Project does not address pruning, fertilizing or soil health, integrated pest management, and shrub, tree, and/or turf maintenance for most elements in the selected landscape. Project presents a plan of action which may be missing significant amounts of information. The plan could not be implemented successfully in the landscape. (2)	Project is missing one of the planting requirements and other is minimal.(4) Project contains a few maintenance tasks specific to their plant palette. (4) Project minimally addresses pruning, fertilizing or soil health, integrated pest management, and shrub, tree, and/or turf maintenance for the specified plants. Project presents a plan of action which may be missing some information. The plan could not be successfully implemented in the landscape. (4)	Project is missing one of the planting requirements and other is comprehensive. (6) Project contains some maintenance tasks specific to their plant palette. (6) Project addresses pruning, fertilizing or soil health, integrated pest management, and shrub, tree, and/or turf maintenance for some of the specified plants. Project presents a plan of action which may be missing some information. The plan could be implemented in the landscape and be largely successful. (6)	Project contains both of the planting requirements but both are minimal. (8) Project contains many maintenance tasks specific to their plant palette. (8) Project addresses pruning, fertilizing or soil health, integrated pest management, and shrub, tree, and/or turf maintenance for most of the specified plants. Project presents a plan of action which may be missing some information. The plan could be implemented in the landscape and be largely successful. (8)	Project contains both of the planting requirements and both are thorough. (10) Project contains most maintenance tasks specific to their plant palette. (10) Project correctly addresses pruning, fertilizing or soil health, integrated pest management, and shrub, tree, and/or turf maintenance for all elements in the selected landscape. Project presents a well-thought out plan of action to address all issues in the landscape. The plan could be implemented successfully in the landscape. (10)	
Thoroughness II /Requirements (20)	No title page (1) No Table of contents (1) No detailed inspection report or plant list (1) No aerial map, sketch or photos (1)	Title pg w/little info (2) Table of Contents w/few entries (2) Minimal inspection report or plant list (2) Minimal aerial map or photos missing most features (2)	Title page w/ some info(3) Table of Contents w/some entries (3) Incomplete inspection report or plant list or missing botanical names (3) Aerial map or photos with some features (3)	Title pg w/most info (4) Table of Contents w/ most entries(4) Majority of inspection report and plant list (4) Aerial map or photos with most features (4)	Title page with all info(5) Table of contents with all entries (5) Thorough inspection report and plant list with botanical names (5) Thorough aerial map or photos with all features (5)	
Quality (10)	All information is cut and paste (2)	Most information is cut and paste (4)	Some information is cut and paste (6)	Minimal information is cut and paste (8)	No information is cut and paste (10)	
Quality (20)	No evidence is informative and well selected/specific for property (4)	Minimal evidence is informative and well selected/specific for property (8)	Some evidence is informative and well selected/specific for property (12)	Most evidence is informative and well selected/specific for property (16)	All evidence is informative and well selected/specific for property (20)	

Soils and Plant Nutrition Group Project Rubric	Excellent (5)	Satisfactory (3)	Benchmark (1)
Report Title Page & Authors	Contains report title, names of group members, date, course, and instructor name.		
SMU - Description of Site and Map (5 points)	Contains general site information; total square footage, location, topography, orientation, drainage, and construction issues, with a color coded map showing location of SMU's. (Location of off campus SMU's noted and mapped.)	One to two categories missing, inclusion of color coded map showing location of SMU's. (Location of off campus SMU's noted and mapped.).	More than two categories missing or color coded map not included.
SMU - Rationale for Separate SMU's (5 points)	Rationale noting the differences for each SMU in topography, texture, or plant material. 3-5 SMU's included.	Incomplete description of one to two SMU's, or rationales not noted, or two SMU's similar. 3-5 SMU's included.	Three or more descriptions of SMU's incomplete, or rationales not noted, or less than 3 SMU's submitted.
SMU - Physical Properties of Soils Consistency, Color, Texture **SMU - Chemical Properties of Soils** Humus, pH, N, P, K, Ca, and Mg **(40 points)**	Complete description of consistency and color using terms discussed in class. Munsell chart designations included. Texture listed with percent of sand, silt, and clay with textural classification correct for each SMU.	Descriptions unclear or untypical terms used for consistency and color, or lacking Munsell chart designations, or texture %'s and textural classification wrong.	Descriptions unclear or untypical terms used for consistency and color, or lacking Munsell chart designations, or texture %'s and textural classification wrong.
	Complete table of test results including: humus #; pH #; N-P-K (lbs/a & ppm); Ca-Mg (ppm & meq) for each SMU.	Incomplete table of test results missing one to two entries or miscalculated conversions for each SMU.	Incomplete table of test results missing three or more entries or miscalculated conversions for each SMU.
SMU - Recommendations for Soil Fertilization (15 points)	Complete and accurate calculations for type of fertilizer or amendment, fertilizer ratio, fertilization rate (pounds / 1000 square foot), frequency per year and when to apply, actual pounds of fertilizer / application for area in each SMU.	Incomplete or inaccurate calculations for one to two of three SMU's.	Incomplete or inaccurate calculations for three or more SMU's.
SMU - Recommendations for Soil Management (15 points)	Complete, thoughtful and insightful recommendations, regarding soil organisms, mulch, avoiding compaction, etc. for each SMU included.	Complete recommendations for each SMU included as discussed in class.	Incomplete recommendations for each SMU.
Conclusion (5 points)	Describes sustainable or best management practices (BMP's) to employ for protection, correction, and improvement of soils and management of sites overall.	Summary reiterates recommendations above for specific SMU's, and only adds one to two comments for sustainable practices or BMP's overall.	Summary reiterates recommendations above for specific SMU's with no comment on sustainable practices or BMP's overall or summary not included
Quality and Clarity of Report ` (5 points)	Clear and concise information delivered in a logical, coherent manner for best understanding by client.	Written material difficult to read or find information resulting in incomplete understanding by client.	Written material difficult to read and find information resulting in incomplete understanding by client.
Quality and Clarity of Group Presentation (10 points)	Clear and concise delivery of information with use of appropriate media and participation of each group member, resulting in complete understanding by the class.	Unclear or rambling delivery of information with use of appropriate media and participation of each group member, resulting in incomplete understanding by the class.	Unclear, rambling delivery of information and use of inappropriate media, lacking participation of each group member, resulting in incomplete understanding by the class.

CSS 200 - SOILS and PLANT NUTRITION - PROJECT GUIDELINES

Each of you will be given a site plan for a site here on campus. You will also be given (or will have to measure) square footages of areas from the site plan. As a group of 5-6 students, you will gather samples and produce data for each **Soil Management Unit** determined by your group. Data from each group will be analyzed, calculations made and written into a report. Each group will make a 15-20 minute presentation of their findings to the classroom on the due date.

<u>As a group</u> you are to prepare a Soil Management and Fertilization Report as if for a client. That report will be typed and follow the format below:

- **Report Title & Authors**

- **Description of Site** – (where site is located, the topography of the site, orientation, drainage, construction issues, etc.)

- **Soil Management Units** – [using your site plan, outline soil management areas, list by Roman numeral with a brief description and **rationale** for creating as a unit (listing differences in topography, texture or plant material), **minimum of three units for report.]**

  For each Soil Management Unit:

  1. **Description of Soil** - (A description of physical properties of the first 6" of soil - i.e., consistency and color)

  2. **Soil Test Results** - (texture, humus, pH, N, P, K, Ca, and Mg)

  3. **Recommendations for Fertilization** (specific type of fertilizer or amendment, fertilizer ratio, fertilization rate (pounds / 1000 square foot), frequency per year and when to apply, actual pounds of fertilizer / application for area in soil management unit)

  4. **Recommendations for Soil Management** (soil organisms, mulch, avoiding compaction, mowing, etc.)

- **Summary of your findings –** (describe patterns seen and general BMP's for management overall)

Alternatively, your group could substitute 1-2 SMU's above for your own landscape soil sample(s) For this option, a full description of the site (location of the site, topography, etc.), and photos of the site must be included. If you select this option, you are responsible for all the measuring of areas and sampling required for making a full report for your own SMU. **This option does not allow the student to opt out of field and lab testing for the group soil sampling above.**

DUE DATE: Week #10 of class (March 8th PM, March 10th AM - No late reports accepted)
CSS 200 - SOILS and PLANT NUTRITION – PROJECT GRADING

Student Names

Soils Presentation and Report Grading Guidelines:

- Have you made a complete description of the site and included your **rationale** for dividing into soil management units? (10 pts.)

  _____

- For each unit, have you included a complete description of the physical soil properties and listed all your test results? (40 pts.)

  _____

- Interpretation of the results, recommendations for fertilization and soil management (30 pts.)

  _____

- Quality and Clarity of Presentation: (10 pts.)

  _____

- Quality and Clarity of Report: (10 pts.)

  _____

Project Grade _____

Comments: