COURSE OUTLINE

Week 1
Orientation—discussion of course content, calculator and drafting gear requirements, textbook, weekly reading assignments, homework assignments, exercises, grades, and term project Why grade; basic principles and history of grading Contour lines and contour signatures illustrated and defined in plan view Keynote presentation*—contour lines and contour signatures Introduction to topographical maps and plotting whole number contour lines Spot elevations defined Plotting whole number contour lines using the interpolation method Introduction to grid coordinate lines and engineering stationing Exercise 1, Basic Contour Signatures Reading Assignment: All students: Read this syllabus in its entirety; The Grading Book—read all of Chapters 1, 2 and 3. Chapter 7, study the Slope Visualization Diagram on page 7-44. Homework Assignment 1, Creating a Topographical Map Using the Interpolation Method Term Project Parts A and B assigned; review of problem statement * Keynote is a Macintosh-specific program similar to PowerPoint that runs on Macintosh computers, iPads and iPhones (an iPad will be used to present slide shows)

Week 2
Review homework assignment 1 and hand out solutions Discussion of the natural landscape and dynamics of earth building processes, plate tectonics Soils and soil classification systems The language of Construction Methods—glossary of terms that relate to the term project How basic contour signatures are used to create complex manmade built environments Introduction to the three primary grading formulas (as reproduced on name placards) Differentiating between asphalt concrete (AC) and portland cement concrete (PCC) in plan view Keynote presentation—Drainage and grading features (applies to Part A of Term Project) Exercise 2, Additional Familiarization with Contour Lines and Contour Signatures Exercise 3, Working with Decimal Numbers and the Grading Formulas Homework Assignment 2, Working with the Grading Formulas Reading Assignment: The Grading Book—Chapter 4, pages 2 through 21 (to Calculator Shortcuts); be familiar with the sample problems; Chapter 7, page 45, and be familiar with the Grade Measuring Device.

Week 3
Review homework assignment 2 and hand out solutions Keynote presentation—how a golf green is constructed
Sub drainage using perforated pipes
Concept of capillary action and how it affects the movement of water in soil
Plotting contour lines on plane surfaces
More on the three grading formulas

**Exercise 4, Plotting Whole Number Contour Lines on Plane Surfaces**

**Homework Assignment 3, Plotting Whole Number Contour Lines on Plane Surfaces**

**Reading Assignment:** The Grading Book—Chapter 4, pages 21 (from Calculator Shortcuts) to 33 (to Designing Cross Slopes With the Cross Slope Formula).

**Week 4**

- Review of homework assignment 3 and hand out solutions
- Review plotting contour lines on plane surfaces
- Review of contour signatures, natural and manmade landform types
- Basic grading, problem solving and manipulation of contour lines
- Design of steps
- Calculating the height of a curb, crown of a road, or wall, or depth of swale or ditch
- Role of landscape architect, civil engineer, and grading contractor and field issues

**Exercise 5, Revising Contour Lines**

**Homework Assignment 4, Revising Contour Lines**

**Reading Assignment:** The Grading Book—Chapter 4, pages 33 (From Designing Cross Slopes With the Cross Slope Formula) through 39 (to How to Design a Horseshoe Swale).

**Week 5**

- Review of homework assignment 4 and hand out solutions
- Keynote presentation—miscellaneous
- Design of cross slopes and the cross slope formula
- High point, low point calculations
- Model making—constructing the quick and dirty model

**Exercise 6, Cross Slopes on Plane Surfaces**

**Exercise 7, Calculating Run to Determine Vertical Height or Depth**

**Exercise 8, Calculating Length (Contour Deflection) Based on Height or Depth**

**Specific Exercise 3, Cross Slope on the Curving Walk**

**Homework Assignment 5, Grading Problems**

**Reading Assignment:** The Grading Book—Chapter 4, from page 39 (from How to Design a Horseshoe Swale) to the end of the chapter (page 68).

**Week 6**

- Review homework assignment 5 and hand out solutions
- Designing a horseshoe swale
- Setting finish floor elevations (rule of thumb)
- Spot elevations, their use and correct placement
- The aesthetics of grading; modeling, mounding, and land sculpting
- Landform Grading, history and application
- Introduction to drainage; drainage systems and concepts, drainage structures

**Note:** mid-term exam next week; in-class review of what mid-term exam will test

No homework assignment for sixth week—use time to study for mid-term

**Exercise 9, Miscellaneous (plotting contours, freeboard and parking lot design)** created)
**Reading Assignment:** The Grading Book—read all of Chapter 5; Chapter 6, pages 2 through 15 (to Cover Over Drainlines—How to Calculate); Chapter 7, pages 21 through 24 down to How Contour Maps Are Created

**Completed base sheet for Term Project Part B is due** (compliance review and critique will be conducted in class)

**Week 7**

**Mid-Term Quiz** (covers all material covered 1\textsuperscript{st} through 6\textsuperscript{th} meeting); review quiz
- Introduction to drainage and stormwater management
- Keynote presentation miscellaneous grading, drainage
- Wetlands and sustainability
- Cover over drainlines
- Head loss in drainage systems and setting invert elevations
- Survey field notes

**Exercise 10, Performing an Elevation Survey**
**Exercise 11, Designing Horseshoe Swales**
**Exercise 12, Miscellaneous (Grading a Level Pad; Grading a Road)**
**Specific Exercise 1, Grading the Parking Lot**
**Homework Assignment 6, Intermediate Grading Problems; Elevation Survey**
**Assignment of Optional Extra Credit Homework Assignment**

**Reading Assignment:** The Grading Book—Chapter 6, page 15, from Cover Over Drainlines—How to Calculate to page 48 down to Regulatory

**Week 8**

Review of homework assignment number 6 and hand out solutions
- Slide show—drainage
- Grading endwalls and headwalls
- Grading on hillsides
- Use of mass gravity retaining structures (gabions)
- Standard Urban Stormwater Mitigation Plan (SUSMP)
- Stormwater Pollution Prevention Plan (SWPPP)
- City of Los Angeles Stormwater Program
- Erosion control
- Permeable paving

**Exercise 13, Minimizing Head Loss in Drainage Systems; Setting Invert Elevations**
**Exercise 14, Maintaining Cover Over Drainlines**
**Exercise 15, Grading a Typical Endwall or Headwall and Setting Invert and Rim Elevations**

**Homework Assignment 7, Advanced Grading Problems; Drainage Systems**

**Reading Assignments:** The Grading Book—Chapter 6 to the end of the chapter.

**Week 9**

Review of homework assignment 7 and hand out solutions
- Surface run-off calculations—the Rational Method (Rational Formula)
- Retention versus detention of stormwater—what’s the difference?
- Bio swales
- First flush runoff and debris separators
- Earthen dam design
- On-campus field trip to visit design studio site—wear appropriate clothing and footwear

**Exercise 16, Rational Method**
Exercise 17, Reading an Electronic Polar Planimeter
Term Project review
Homework Assignment 8, the Rational Method; Design of Retention/Detention Structures
Reading Assignment: The Grading Book—Chapter 7, pages 2 through 20

Week 10
Review of homework assignment 8 and hand out solutions
Regulatory issues including National Pollution Discharge Elimination System (NPDES)
California Stormwater Regulations and Oversight
Sediment control and introduction to Best Management Practices (BMP)
Introduction to stormwater management
Keynote presentation—stormwater management
Design of retention basins based on footprint size
Design of retention basins based on cubic foot capacity
Designing a retention basin on a flat site
Week 10 continues on next page 10
Designing a retention basin on a steeper site
In-class demonstration of polar planimeter
Cut and fill: Average End Area Method; Planimeter Method; Barrow Pit Method
Exercise 18, Stormwater Retention and/or Detention and Designing an Earthen Dam
Exercise 19, Retention and/or Detention Pond on a Flat Site
Homework Assignment 9, Calculating Cut and Fill Volumes
Reading Assignment: The Grading Book—Chapter 7, pages 24 through page 29 (Grading Engineering Requirements)
Term Project Part A Due for Hand-in

Week 11
Review of homework assignment 9 and hand out solutions
Horizontal and vertical road design road design
Profiles and stationing, coordinate systems
Performing an elevation survey
Defining watershed areas
Designing to specific grade limits
Guest lecturers, City of Los Angeles, Departments of Sanitation and Bureau of Engineering
Reading Assignment: The Grading Book—Chapter 7, pages 29 to end of chapter
Homework Assignment 10, Horizontal Road Design; Vertical Curve Design
Exercise 20, Watershed Area Delineation; Buildable Area Based on Slope

Week 12
Review of homework assignment 10 and hand out solutions
Grading engineering requirements, utilities permits and codes
Compaction of soil
Bearings of lines
Exercise 21, Bearings of Lines
Exercise 22, Control Joints and Expansion Joints in Concrete Paving
Homework Assignment 11, Bearings of Lines
Optional Extra Credit Homework Assignment Due For Hand-In
Week 13
Review of homework assignment 11 and hand out solutions
Score lines and control joints in concrete paving

**Exercise 23, Advanced Parking Lot Grading Plan**

**Homework Assignment 12, Placing Score Lines and Construction Joints in Concrete**

**Week 14**

Review of homework assignment 12 and hand out solutions

Geotechnical, understanding and interpreting soil borings

**Exercise 24, Grading a Tot Lot**

**Exercise 25, Geotech Grading Plan**
Week 15
Final Exam Primer—in-class review of what final exam will test.
Course wrap-up and review
Term Project Part B Hand-in
Exercise 26, Designing a Large Retention Basin

Final Examination—Will test all material covered from the first through the fifteenth week. Duration two hours. Final Exam is worth 200-points. Room to be announced.

Grading standards and other important course information follows.

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<th>GRADED ASSIGNMENT</th>
<th>POINTS AWARDED</th>
<th>TOTAL POSSIBLE</th>
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<tr>
<td>Homework Assignments, twelve, each worth 50 points</td>
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<td>Mid-term Exam</td>
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<td>Final Examination</td>
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<tr>
<td>Term Project Part A</td>
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<td>Term Project Part B</td>
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<td><strong>Total Points Possible for Semester</strong></td>
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Extra Credit—One optional Extra Credit Homework Assignment will be assigned at the 7th week and is due the 12th week that can add up to 20 extra points to the point total. The mid-term quiz also includes one Short Answer Bonus Question worth 5 up to extra points on the quiz score. The sum of the two extra credit points make it possible to earn a grand total of 1275 points for the semester.

**Letter Grade Earned Based on Point Spread**

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<th>Grade</th>
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<th>Grade</th>
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<tr>
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<td>A</td>
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Upon completion of this course, the student will have a thorough working knowledge of these KSAs:

The ability to identify natural and manmade contour signatures and to utilize contour signatures in grading design through the manipulation of contour lines
Possess the skills necessary to grade a site of moderate complexity

The ability to apply the basic grading formulas to calculate grade, length, vertical difference elevation and cross slope

The ability to design drainage systems and apply common drainage formulae such as the Rational Formula

Understand and be able to apply stormwater management design KSAs, including the design of retention and detention basins, control of first flush runoff, erosion control, and knowledge of current regulatory requirements

Grading design aesthetics and familiarity with landform grading principles

Other KSAs traditionally associated with Construction Methods:
• Cut and fill calculations
• Road design through the use of horizontal and vertical curve design techniques
• Bearings of lines and coordinate systems
• Use of a polar planimeter to determine areas of non-geometric shapes
• Basic elevation surveying
• Creation of topographical maps from raw survey data
• Creation of a simple study model
• Field grading practices
• Codes, ordinances and regulatory requirements that pertain to grading and drainage design
• Soil compaction, compaction techniques and compaction testing
• Use of and correct placement of expansion/contraction joints and control joints in concrete paving
• Familiarity with standard construction details that pertain to grading and drainage design

Construction Methods Textbook
The Grading Book was written specifically for Construction Methods. Weekly readings in The Grading Book have been assigned in the week-by-week portion of this syllabus (look for the stacked book symbol to identify reading assignments).

Important: Reading assignments are relevant to material that is up-coming so it is imperative that each reading assignment be completed during the week immediately prior to the next class meeting. Readings are also meant to provide a context for the subject currently being discussed. Keeping up with the reading assignments will go a long way toward insuring a thorough understanding of the KSAs being taught.

The Grading Book, Fifteenth Edition will be available as a reader from:
University Graphics (AKA: Magic Machine)
University Village
3309 S. Hoover, Los Angeles 90007, telephone at (213) 744-1511
Assignment Submission
Students are required to hand assignments in at the beginning of the class on the date they are due. A hard copy solution to the homework assignment will be exchanged for homework handed in.

About Professional Licensure
The focus of Construction Methods is on grading, drainage and stormwater management as it is practiced professionally. Although this class is not intended as a preparation for the national licensing examination (the Landscape Architects Registration Examination or LARE), the material that is presented, broadly speaking, matches what the exam tests.

Course Enhancement/Enrichment
Two high quality online magazines are available free of charge that are extremely relevant to Methods and Materials are Stormwater and Erosion Control. To receive free online subscriptions, click on the respective Web addresses below:

For Erosion Control:

For Stormwater:
http://www.stormh2o.com/SUBSCRIPTION/STORMWATER-SUBSCRIPTION-FORM-3431.ASPX

Recommended Alternative Textbooks—For most students, The Grading Book will be all that's needed to master Methods and Materials. Nevertheless, some students might benefit from hearing the grading story told in an alternate way. One of the best basic grading textbooks is the classic Grade Easy by Richard K Untermann. Here are the particulars:

• Grade Easy by Richard K. Untermann, $30. The ISBN is 0-941236-25-0. ASLA’s database describes Grade Easy this way: Published in 1973, 119 pp., b/w illus., paperback. Devoted to grading, principles of drainage, grading and road alignment. Techniques explained in an easy-to-do, non-technical manner, step-by-step, with summary checklists, definitions and clear illustrations.

Two excellent resource books that every student in the Master of Landscape Architecture Program should have in their library are:

• Time Saver Standards for Landscape Architecture.

• Landscape Architect's Portable Handbook by Dines and Brown (condensed version of Time Saver Standards).

Attendance Policy
The School of Architecture’s general attendance policy is to allow a student to miss the equivalent of one week of class sessions (three classes if the course meets three times/week, etc.) without directly affecting the student's grade and ability to complete the course. If additional absences are required for a personal illness/family emergency, pre-approved academic reason/religious observance, the situation should be discussed and evaluated with the faculty member and appropriate Chair on a case-by-case basis. For each absence over that allowed number, the student's letter grade will be lowered 1/3 of a letter grade (e.g., A to A–).
Any student not in class within the first 10 minutes is considered tardy, and any student absent (in any form including sleep, technological distraction, or by leaving mid class for a long break) for more than 1/3 of the class time can be considered fully absent. If arriving late, a student must be respectful of a class in session and do everything possible to minimize the disruption caused by a late arrival. It is always the student's responsibility to seek means (if possible) to make up work missed due to absences, not the instructor's, although such recourse is not always an option due to the nature of the material covered.

Being absent on the day a project, quiz, paper or exam is due can lead to an “F” for that project, quiz, paper or exam or portfolio (unless the faculty concedes the reason is due to an excusable absence for personal illness/family emergency/religious observance). A mid term or final review is to be treated the same as a final exam as outlined and expected by the University.

See full attendance statement at: http://arch.usc.edu/People/SchoolGovernanceDocuments

Statement for Students with Disabilities
Any student requesting academic accommodations based on a disability is required to register with Disability Services and Programs (DSP) each semester. A letter of verification for approved accommodations can be obtained from DSP. Please be sure the letter is delivered to me (or to TA) as early in the semester as possible. DSP is located in STU 301 and is open 8:30 A.M.–5:00 P.M., Monday through Friday. The phone number for DSP is (213) 740-0776.

Statement on Academic Integrity
USC seeks to maintain an optimal learning environment. General principles of academic honesty include the concept of respect for the intellectual property of others, the expectation that individual work will be submitted unless otherwise allowed by an instructor, and the obligations both to protect one's own academic work from misuse by others as well as to avoid using another's work as one's own. All students are expected to understand and abide by these principles. SCampus, the Student Guidebook, contains the Student Conduct Code in Section 11.00, while the recommended sanctions are located in Appendix A: http://www.usc.edu/dept/publications/SCAMPUS/gov/. Students will be referred to the Office of Student Judicial Affairs and Community Standards for further review, should there be any suspicion of academic dishonesty. The Review process can be found at: http://www.usc.edu/student-affairs/SJACS/. The USC summary of how to avoid plagiarism: http://www.usc.edu/student-affairs/student-conduct/ug_plag.htm and specific advice for grad students: http://www.usc.edu/student-affairs/student-conduct/grad_ai.htm may also be useful.

Statement on Landscape Accreditation
The Master of Landscape Architecture degree program includes three curricula. Curriculum +3 for students with no prior design education and Curriculum +2 for students admitted with advanced standing have full accreditation by the Landscape Architecture Accreditation Board. Curriculum +1.5 for students with advanced placement is a post-professional study and is not subject to accreditation. Information about landscape architecture education and accreditation in the United States may be found on-line at http://www.asla.org/Education.aspx.

Due Date Policy
All homework and the both parts of the term project are due at the beginning of class on the date noted on the assignment. Late work will be penalized with a point reduction of 10% per week. For example, homework assignments worth 50 points incur a reduction of 5 points per
week (from 50 to 45 points for one week late). If a class must be missed and the student will not be available to turn in a homework assignment in person, there are three options to avoid a late work penalty: 1) Mail it to the instructor at the address shown on first page; 2) have a classmate hand it in on your behalf; 3) scan the assignment and send it as an email attachment (due to scaling issues, digital photographs will not be accepted; facsimile copies will also not be accepted.

Class Participation and Questions
Asking questions relevant to the current discussion generally benefits all. Ask questions at any time. Qualification: If the question reveals failure to do the assigned reading, the instructor may elect not to immediately answer the question, but will do so during the break or after class. In all cases the instructor reserves the right to control questions if they are becoming excessive or disruptive.

Study Groups and Working With Others
As mentioned earlier, this study strategy is highly recommended—but with a qualification. Forming a study group is an excellent way to get—and give—help in areas that are challenging. Getting help has obvious advantages. So does giving help—doing so reinforces what is already known, and often reveals a less than complete understanding in areas that heretofore were thought to be complete, but were not. Qualification: Keep in mind that all final work must be student's own work. If outright copying is detected, all parties engaging in the practice risk losing some or all of the points for any given assignment. The student only benefits when the student does the assignment.

Legibility
All work must be legible. Illegible answers will be marked as incorrect (sorry, no benefit of the doubt).

Personal Problems
Personal problems happen. If experiencing personal problems that are adversely impacting performance, please let the instructor know. Often there are ways to accommodate or mitigate personal problems.