



LAND 443

STORMWATER MANAGEMENT

Fall 2016

University of Nevada Las Vegas - School of Architecture - Room 180

3 Credits

Pre-Requisite : LAND 241

Schedule :

Instructor:

Contact:

Office Hours :

Course Description

Lecture course addressing the design and calculations of stormwater management systems, best management practices, surface and subsurface drainage systems, basic hydrology, horizontal and vertical layout, specifications of planting plans, demolition and tree preservation plans, specifications, and erosion and sediment control design and practices.

Class Structure

This is an exploratory course of basic hydrologic principles and stormwater management and its relevancy to Southern Nevada. In addition to understanding fundamental concepts of stormwater through drainage patterns, volume calculations, green infrastructure and best management practices, contemporary strategies will be analyzed and tested within the context of dry arid climates and existing policies in Las Vegas.

Scheduled course time will be addressing the calculations and design of stormwater management systems through advanced computational modeling and applied within a working physical model.

Methodology

Lectures and presentations will inform policy and legislation in the varying context of water resources to invoke scholarly research and critical thinking. Basic principles and fundamentals of stormwater management will assist in the appropriate representation and dialogue amongst allied professions.

The exercises are designed to impart critical thinking and specific skills associated with best management practices in storm water management. Students will be able to demonstrate these concepts through applied research, data collection, responsive digital modeling and representation, and robust physical modeling techniques. The course is structured to fully understand existing demonstrations and the dissection of how hydrologic issues are discovered and addressed within the practice of landscape architecture.

The temporal and organic nature of water and hydrology require dynamic and advanced methods through computational modeling to catalog ecological impact in the natural and built environment.

Learning Objectives and Student Learning Outcomes (SLOs)

Learning Objective 1: Inquiry and Critical Thinking*

Upon completion of this course, students will be able to generate design ideas derived from a critical approach to the research and analysis of multiple historical, technical, theoretical, social, political, economic, cultural and environmental contexts. An emphasis will be placed on the value of engaged scholarship and critical inquiry as means for determining appropriate design, management, and planning strategies in landscape architecture.

** This Learning Objective directly aligns with the University Undergraduate Learning Objectives (UULOS) for Intellectual Breadth and Lifelong Learning, and Global/Multicultural Knowledge and Awareness, and for Inquiry and Critical Thinking.*

SLO 1.1

Use quantitative and qualitative research methods to identify the complexity of problems, and identify different perspectives from which problems and questions can be answered at a reinforced level.

SLO 1.2

Access, collect, and use primary and secondary resources to create precedent and typology case study analyses from the fine arts, natural sciences, social sciences, and humanities as they apply to landscape architecture specific problems and questions at a reinforced level.

SLO 1.3

Identify and critically evaluate the lessons learned from precedent and typology case study analyses at a reinforced level.

SLO 1.4

Generate and defend programmatic criteria and design proposals using the lessons learned to inform landscape architecture design, planning and management solutions at a reinforced level. An emphasis will be placed on the evaluation and identification of conclusions, including areas where further inquiry may be needed.

Learning Objective 2: Design Process and Implementation

Upon completion of this course, students will be able to apply the design process as it relates to the professional practice of landscape architecture at an introductory level. An emphasis will be placed on the development of an iterative, critical, approach to designing at a variety of scales.

SLO 2.1

Generate appropriate site inventory, site analysis, and site programming schema at a reinforced level.

SLO 2.2

Generate appropriate design concepts and alternatives, and test them against pertinent conditions at a reinforced level.

SLO 2.3

Generate and defend formal design proposals that integrate site design principles and typologies. An emphasis will be placed on an iterative approach to creating two and three-dimensional compositions at a reinforced level.

SLO 2.4

Incorporate the natural elements, forms, and processes of the project site. An emphasis will be placed on climatic conditions, soil types, hydrology, plant species and communities, and wildlife species and communities at a reinforced level.

SLO 2.5

Incorporate applicable site design strategies related to circulation, site grading and drainage, and stormwater management at an introductory level.

Learning Objective 3: Communication and Representation*

Upon completion of this course, students will demonstrate the ability to apply a wide range of communication methods to articulate landscape architecture design proposals.

** This Learning Objective directly aligns with the University Undergraduate Learning Objectives (UULOS) for Communication.*

SLO 3.1

Demonstrate effective written, graphic, and oral communication skills through the delivery of project presentations at a reinforced level.

SLO 3.2

Produce effective graphic presentations using a wide range of appropriate analog and digital media at a reinforced level.

SLO 3.3

Apply innovative technologies commonly used to research, analyze, and communicate landscape architecture design proposals at a reinforced level.

Learning Objective 4: Applied Technologies and Material Systems

Upon completion of this course, students will demonstrate the ability to apply a wide range of appropriate design tools, material systems, and technical applications.

SLO 4.1

Use innovative tools, processes, and applications to generate technically accurate drawings and models at a reinforced level.

SLO 4.2

Use innovative tools, processes, and applications to generate technically accurate and environmentally appropriate grading, drainage, and stormwater management plans at an introductory level.

SLO 4.5

Use innovative tools, processes, and applications to generate digitally fabricated design prototypes at a reinforced level.

SLO 4.6

Demonstrate an understanding of the uses of applied technologies to promote the discipline of landscape architecture at a reinforced level.

Learning Objective 5: Collaboration*

Upon completion of this course, students will be able to demonstrate the ability to work within larger collaborative systems.

** This Learning Objective directly aligns with the University Undergraduate Learning Objectives (UULOS) for Global/Multicultural Knowledge and Awareness.*

SLO 5.1

Generate design proposals that acknowledge landscape architecture within the broader context of allied design professions at an introductory level at a reinforced level.

SLO 5.2

Work in collaboration with diverse groups to generate complex landscape architecture design proposals at a reinforced level.

SLO 5.3

Demonstrate awareness of one's own place in and effect on the world at a reinforced level.

Learning Objective 6: Leadership, Ethics, and Practice*

Upon completion of this course, students will be able to demonstrate an understanding of the need to manage, advocate, and act legally, ethically and critically for the good of the client, society, and the environment.

**The UNLV BLA Collaboration Learning Leadership and Practice directly reflect the University Undergraduate Learning Objectives (UULOS) for Citizenship and Ethics.*

SLO 6.1

Demonstrate the need for landscape architects to provide leadership in the design, management, and planning of socially, economically, environmentally, and physically sustainable environments at a reinforced level.

SLO 6.3

Demonstrate a basic understanding of the ethical principles and legal aspects of the practice of landscape architecture at a reinforced level.

SLO 6.5

Generate a professional portfolio that documents entry-level professional skills at a reinforced level.

Semester Schedule

Week	Day & Month	Lesson
1	August 30	Introduction
	Sep 1	Basic Hydrology Principles/ Exercise 1 Assigned
2	6	Exercise 1.1 Due / LAB: Analog2Digital with 123DCatch
	8	NO CLASS
3	13	Climate Processes
	15	LAB: System Modeling (Precipitation, Terrain & Drainage)
4	20	Environmental Impact
	22	LAB: Computational Conditions (Stormwater Calculator)
5	27	LAB: Computational Conditions (Stormwater Calculator)
	29	LAB: Computational Conditions (Stormwater Calculator)
6	Oct 4	Exercise 1.2 Due / Context and Policy / Exercise 2 Assigned
	6	Response & Performance – Contemporary Approaches and Practices
7	11	Resilience & Response – Integrated Management
	13	Emulating Natural Systems – Strategic Water Conservation
8	18	Exercise 2 Due / DEBATE NO CLASS
	20	Ecological Services & Products - Onsite Wastewater Treatment Processes
9	25	Exercise 3.1 Assigned – Stormwater Runoff Reduction
	27	LAB: Reduction - Components, Sizing & Detail
10	Nov 1	Exercise 3.1 Due / Exercise 3.2 Assigned – Runoff Mitigation: Evapotranspiration & Infiltration
	3	LAB: Mitigation - Components, Sizing & Detail

11	8	Exercise 3.2 Due / Exercise 3.3 Assigned – Runoff Conveyance
	10	LAB: Conveyance - Components, Sizing & Detail
12	15	Exercise 3.3 Due / Exercise 3.4 Assigned – Stormwater Treatment & Restoration
	17	LAB: Treatment - Components, Sizing & Detail
13	22	Exercise 3 Due / Exercise 4 Assigned – Strategic Reuse Plan & Specialized BMPs
	24	NO CLASS - THANKSGIVING
14	29	LAB: Modeling Charrette & Desk Crits
	Dec 1	LAB: Modeling Charrette & Desk Crits
15	6	LAB: Modeling Charrette & Desk Crits
	8	LAB: Modeling Charrette & Desk Crits
16	13	Exercise 4 Due

Required Reading

Strom, Steven; Nathan, Kurt; Woland, Jake; Lamm, David. Site Engineering for Landscape Architects. 6th Edition.

Recommended Reading

Calkins, Meg. The sustainable sites handbook. 2011.

Green Values Stormwater Management Calculator. <http://greenvalues.cnt.org/calculator/calculator.php>.

Schiariti, Paul, P.E., CPESC. Basic Hydrology Time of Concentration Methodology. <http://njscdea.ncdea.org/Time%20OfConcentrationMethodology.pdf>.

Shorto, Russell. How to Think Like the Dutch in a Post-Sandy World. http://www.nytimes.com/2014/04/13/magazine/how-to-think-like-the-dutch-in-a-post-sandy-world.html?ref=magazine&_r=0. 2014.

Urban Hydrology for Small Watersheds. <http://www.cpesc.org/reference/tr55.pdf>.

The Value of Green Infrastructure A Guide to Recognizing Its Economic, Environmental and Social Benefits. <http://www.cnt.org/repository/gi-values-guide.pdf>.

Required Materials

Working Laptop with 3D Rhinoceros and Grasshopper plugin. Additional plugins will be discussed prior to supporting lectures.

Modeling materials: plywood, chipboard, aggregate, plants.

Grading Criteria

Grading takes into consideration content and process, both of which are crucial to the evolution of any design student's educational development. Evaluation of content is based on a student's intellectual development and looks at both how the student articulates their design development and the originality and appropriateness of the idea. Evaluation of process considers the general quality, clarity, precision, and craftsmanship of the presentation. – Thus, neither merely completing all the presentation requirements, nor merely having a good idea, will be enough to achieve a good grade. Curiosity and inquiry,

ability to respond to criticism, ability to generate and critically analyze your own ideas, responsibility, and work ethic all play a role in this process.

Grading Structure

The following standards supplement the Grading System for Undergraduate Students as listed in the current Undergraduate Catalog.

A

Superior: Represents comprehensive excellence. Not only does the work fulfill all requirements in an excellent and professional manner but goes beyond the given requirements aiming at standards higher than requested. The student is an active and engaged participant in all class activities and intellectual progress and development have been demonstrated by the timely preparation of thoughtful work on a regular basis. This work is of a quality that is instructive to the teacher and exemplary to the rest of the class.

B

Above Average: Represents work that can be distinguished as being of truly "good" quality. This work is of a quality that has been instructive to the rest of the class. The work is free of significant flaws, is comprehensive in scope, and is recognizable as coherent architecture. The student is an active and engaged participant in all class activities and intellectual progress and development have been demonstrated by the timely preparation of work on a regular basis.

C

Average: Represents satisfactory and average performance. The work is free of major design flaws and is recognizable as coherent architecture. Intellectual progress and development have been demonstrated by the timely preparation of work on a regular basis. The student and instructor can take "satisfaction" in the average resolution of the design exercise.

Students of Architecture, Interior Architecture and Design, and Landscape Architecture must attain a minimum grade of "C-" in all coursework taken within the School of Architecture as a part of the completion of their major course requirements. Students who attain any grade below a "C-" in any course within their major must retake that course and attain a minimum grade of "C-" in order to advance towards graduation.

D-F

Failing: Represents substandard work that is not passable. Work has not fulfilled requirements, or has not been completed on time, or does not appropriately address the design exercise, and is unacceptable.

I

Incomplete: An Incomplete on a project can only be given in exceptional cases in which failure to complete the assignment is a result of illness or injury requiring a visit to a doctor, a death in the immediate family, military or legal obligations, or other equally serious reasons that can be documented in acceptable written form (such as medical records or legal notification). When possible, all outstanding circumstances that might impact the completion of a project should be brought to the instructor's attention in advance of the class(es) that may be missed. In addition, documentation for excused absences must be provided no later than the third class meeting following the event or the absence(s) will be counted as unexcused and no Incomplete can be given. All incomplete work is subject to late penalties as per the instructor's policy.

An Incomplete in a course is only given in exceptional cases where there is/was a serious excusable reason for not completing course requirements (see above). The quality of work in the course up to that point has been satisfactory and passing (see the Undergraduate Catalog for further details).

Instructors are permitted to assign + or – to grades. However, there is no grade of "A+" within these guidelines.

Semester Grade Breakdown:

Project 1 - 15% of semester grade

Project 2 - 20% of semester grade

Project 3 - 35% of semester grade

Project 4 – 20% of semester grade

Submission of Final Portfolio – 10% of grade

UNLV Landscape Architecture Program Incomplete/Late Work Policy

Late Work

Late work will not be accepted. If appropriate, i.e. in the case of an excused absence, the decision to accept make up work will be handled by the studio critics on a case-by- case basis.

Incomplete Work

Incomplete work will not be accepted. The submission of incomplete work will result in the issuance a zero mark for that assignment.

Evaluations

Student Evaluation of Faculty Member(s)

Students have the opportunity to formally evaluate the faculty at the end of term. You are also encouraged to speak to us at any time with responses, suggestions or feedback - positive or negative. It is important to keep up with good communications. Please bring up any concerns privately, or, if necessary, publicly, with the whole class.

Class evaluations will be available for students to complete during the last two weeks of class. All evaluations are confidential; instructors will never know how any one student responded to any question, and students will never know the ratings for any particular instructors.

Faculty Evaluation of Student Progress

Feedback from the instructor will occur in the following ways:

- on request from you
- assignment marks and comments

Grading / Exams / Grade Posting – Each assignment will receive a grade or comments and a “resubmit”. Grades will be provided in writing on assignments, and grade-to-date information will be available upon request.

Jury Week

Jury Week is scheduled for the last week of April, during which our design studio as well as the other landscape architecture design studios will hold final presentations of their term projects. The exact date and time for our final presentations will be determined and announced at a later date. The opportunity to present our work to a diverse jury is a great honor and experience; nonetheless the opportunity to see and hear about other’s projects is also invaluable to your education. You are highly encouraged to attend other class presentations during Jury Week.

Documentation and Retention of Student Work

The Program will keep all presentation material for each project. The materials serve several functions to the Program and the University. They are used to document student outcomes during accreditation and to demonstrate the value of our Program to the University community. Nevertheless, please take photographs, digital images or copies of your projects to use in your portfolio. All students in all classes are required to submit a complete set of work digitally in .pdf format on a CD at the end of the semester to the course instructor.

Portfolio/Submission of Work Policy

At the end of each course all students will submit copies of his or her work in the form of hardcopy and digital portfolios. Submission of the course portfolio is mandatory – NO EXCEPTIONS. Please adhere to the following submission guidelines:

DIGITAL PORTFOLIO

Format

You must download and use the formatted template provided on Blurb.com. Download the Adobe InDesign plug-in at: <http://www.blurb.com/apps/indesign-plugin>.

In Adobe In-Design, Open the Blurb Template Creator under the File drop down menu. Create a new book as Standard Landscape size and Standard paper type.

Create your portfolio using the template guidelines and margins provided in the template.

Submit your portfolio as a .pdf and as an original In-Design file (.indd) to your class DropBox Folder
(No exceptions)

You must burn each file (total of two, .pdf and .indd) to a CD and submit it to your studio/lecture class instructor. It is the responsibility of each student to ensure that his or her files are properly burnt and can be opened.
(No exceptions)

Content

The portfolio must document ALL of the work that you completed during the semester. This includes, but is not limited to process work, sketches, photos of models, final presentation images, written assignments, quizzes, exams, etc.

The portfolio must be clearly organized and in chronological order starting at the beginning of the semester and tracing your progress throughout the remainder of the semester. Each course instructor will set the grade weighting for the portfolio at his or her discretion.

University Policies

Academic Misconduct—Academic integrity is a legitimate concern for every member of the campus community; all share in upholding the fundamental values of honesty, trust, respect, fairness, responsibility and professionalism. By choosing to join the UNLV community, students accept the expectations of the Student Academic Misconduct Policy and are encouraged when faced with choices to always take the ethical path. Students enrolling in UNLV assume the obligation to conduct themselves in a manner compatible with UNLV's function as an educational institution. An example of academic misconduct is plagiarism. Plagiarism is using the words or ideas of another, from the Internet or any source, without proper citation of the sources. See the Student Academic Misconduct Policy (approved December 9, 2005) located at: <https://www.unlv.edu/studentconduct/student-conduct>.

Copyright—The University requires all members of the University Community to familiarize themselves with and to follow copyright and fair use requirements. You are individually and solely responsible for violations of copyright and fair use laws. The university will neither protect nor defend you nor assume any responsibility for employee or student violations of fair use laws. Violations of copyright laws could subject you to federal and state civil penalties and criminal liability, as well as disciplinary action under University policies. Additional information can be found at: <http://www.unlv.edu/provost/copyright>.

Disability Resource Center (DRC)—The UNLV Disability Resource Center (SSC-A 143, <http://drc.unlv.edu/>, 702-895-0866) provides resources for students with disabilities. If you feel that you have a disability, please make an appointment with a Disabilities Specialist at the DRC to discuss what options may be available to you. If you are registered with the UNLV Disability Resource Center, bring your Academic Accommodation Plan from the DRC to the instructor during office hours so that you may work together to develop strategies for implementing the accommodations to meet both your needs and the requirements of the course. Any information you provide is private and will be treated as such. To maintain the confidentiality of your request, please do not approach the instructor in front of others to discuss your accommodation needs.

Religious Holidays Policy—Any student missing class quizzes, examinations, or any other class or lab work because of observance of religious holidays shall be given an opportunity during that semester to make up missed work. The make-

up will apply to the religious holiday absence only. It shall be the responsibility of the student to notify the instructor within the first 14 calendar days of the course for fall and spring courses, or within the first 7 calendar days of the course for summer and modular courses, of his or her intention to participate in religious holidays which do not fall on state holidays or periods of class recess. For additional information, please visit:
<http://catalog.unlv.edu/content.php?catoid=6&navoid=531>.

Transparency in Learning and Teaching—The University encourages application of the transparency method of constructing assignments for student success. Please see these two links for further information:
<https://www.unlv.edu/provost/teachingandlearning>
<https://www.unlv.edu/provost/transparency>

Incomplete Grades—The grade of I—Incomplete—can be granted when a student has satisfactorily completed three-fourths of course work for that semester/session but for reason(s) beyond the student's control, and acceptable to the instructor, cannot complete the last part of the course, and the instructor believes that the student can finish the course without repeating it. The incomplete work must be made up before the end of the following regular semester for undergraduate courses. Graduate students receiving "I" grades in 500-, 600-, or 700-level courses have up to one calendar year to complete the work, at the discretion of the instructor. If course requirements are not completed within the time indicated, a grade of F will be recorded and the GPA will be adjusted accordingly. Students who are fulfilling an Incomplete do not register for the course but make individual arrangements with the instructor who assigned the I grade.

Tutoring and Coaching—The Academic Success Center (ASC) provides tutoring, academic success coaching and other academic assistance for all UNLV undergraduate students. For information regarding tutoring subjects, tutoring times, and other ASC programs and services, visit <http://www.unlv.edu/asc> or call 702-895-3177. The ASC building is located across from the Student Services Complex (SSC). Academic success coaching is located on the second floor of the SSC (ASC Coaching Spot). Drop-in tutoring is located on the second floor of the Lied Library and College of Engineering TEB second floor.

UNLV Writing Center—One-on-one or small group assistance with writing is available free of charge to UNLV students at the Writing Center, located in CDC-3-301. Although walk-in consultations are sometimes available, students with appointments will receive priority assistance. Appointments may be made in person or by calling 702-895-3908. The student's Rebel ID Card, a copy of the assignment (if possible), and two copies of any writing to be reviewed are requested for the consultation. More information can be found at: <http://writingcenter.unlv.edu/>.

Rebelmail—By policy, faculty and staff should e-mail students' Rebelmail accounts only. Rebelmail is UNLV's official e-mail system for students. It is one of the primary ways students receive official university communication such as information about deadlines, major campus events, and announcements. All UNLV students receive a Rebelmail account after they have been admitted to the university. Students' e-mail prefixes are listed on class rosters. The suffix is always @unlv.nevada.edu. Emailing within WebCampus is acceptable.

Final Examinations—The University requires that final exams given at the end of a course occur at the time and on the day specified in the final exam schedule. See the schedule at: <http://www.unlv.edu/registrar/calendars>.

Students may consult with a librarian on research needs. For this class, the subject librarian is https://www.library.unlv.edu/contact/librarians_by_subject). UNLV Libraries provides resources to support students' access to information. Discovery, access, and use of information are vital skills for academic work and for successful post-college life. Access library resources and ask questions at <https://www.library.unlv.edu/>.