Department of Landscape Architecture
School of Design
University of Pennsylvania
Fall 15, LARP 543-001, 543-002 & 543-003
Instructor: Keith VanDerSys, Michael Luegering

Media III: Digital Media (Landscape and Digital Dynamics)

LARP543 continues the curricular emphasis on visual communication and design. The course provides an intensive, hands-on inquiry into the exploration, enhancement, and extrapolation of digital media and the subsequent modes of conceptual, organizational, and formal expression. Through a series of working labs, students are introduced to various software applications and numerically driven techniques as a means to learn basic concepts of rigorous construction and extraction through form processing. Instead of understanding computer modeling simply as an end, this course considers digital media as a compulsory tool in design processes.

The semester's theme is dynamics and flows. In Media II, students embraced iteration as a) a process of computational praxis and b) as attributes of landscape systems. This term delves deeper into the collection and control of information (from the scale of GIS to sited metrics and embedded sensors) and focuses on modeling, parsing, and simulating landscape systems/media as topological, recursive, and spatio-temporal patterns. To do this we will be working with rich fields of landscape attributes (.i.e. data) and creating parametric tools to draw out significant thresholds and distinguish areal effects. Thus computation, in this course, is not about generating complexity (or movement) for its own sake, but rather developing mechanisms (and thus design forms) that respond conditionally, logically, and intelligently to complex, dynamic systems. By using parametric attributes, terrain, surface, and site will be treated as integrated (materially, spatially, temporally) with the larger geophysical, ecological, and environmental exchanges of landscape.

Labs will incorporate GIS, Rhino/Rhino Terrain, Grasshopper and AfterEffects; each software package is approached in terms of creating a) recursive interactions of attributes (analysis, pattern recognition, strategic alteration) within a single-program / range of scales and b) handling attribute data such that it can be accessed, re-integrated, and represented across software/scales. For example, slope, aspect, rain-flow accumulation, and roughness can be modeled in both GIS and Rhino/Grasshopper. The overlap of parametric tools enables the testing of site-scale grading/surfacing/planting alterations in terms of both local and regional effects, drawing out the non-linear potentials and new patterns catalyzed by site manipulations. In addition, animation software and cinematic collation will be explored for their ability to both notate and incorporate diagrammatic duration.

Course Objectives

This course provides a platform to teach a range of computer skills that are essential for all designers, not just those interested in production of complex surfaces. It will address appropriate strategies for managing and converting data and methods for streamlining workflow through various computer applications.

As in analog media, craft is paramount in digital media. Information is not limited by scale or medium. As such, digital models not only need to look good, they need to perform well. With the use of GIS and Grasshopper, both internal and external data handling will be key to your ability to engage with the modeled landscape. Poorly executed and managed models flatten their potential to mere image. An intelligent computational strategy allows for an endless expansion of digital information to be expressed through material outputs.

Course Structure

The class will meet during one action-packed session per week. Each session will include a demonstration of relevant techniques, precedents, and readings (available online as a PDF). In-class laboratory time, with expert guidance, will be provided. Most time will be spent, however, working on developing your familiarity and skills within the three-dimensional modeling environment. Lab time will also be provided outside of class meetings. This time will be set with teaching assistants and will be posted online.

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The course will use a series of short skill-based exercises to introduce concepts, tools, and techniques. Exercises offer an opportunity to attempt different approaches and methods. Students will work individually throughout the semester.

Assignments

Modeling assignments will emphasize the precise collection, assembly, and refinement of data across a variety of software platforms. Assignments are due on a weekly basis. The initial three weeks will be 'still' graphics, with the remainder of the term featuring short animation assignments. The final will culminate with a cinematic collation, edited and extrapolated from the term's animation work. All assignments must be submitted digitally.

Course readings provide a basis for understanding the larger intellectual implications of crafting digitally conceptualized environments. Students are required to submit a 200 word summary of each required reading. All summaries must be submitted digitally.

Seminar Software

Rhino, with the Grasshopper plug-in, will be the primary modeling platform. Associated plug-ins of Rhino Terrain, and V-ray will help extend this toolset. Specific Grasshopper additions will be reviewed in class. GIS will facilitate the collection of extent data and regional re-integration of site alterations. The Adobe CS6 Creative Suite will also be used for documenting and expressing modeling processes through static and time-based visualizations.

Grading

Class attendance and punctuality is mandatory, as much of the content involves hands-on demonstrations. More than three absences will result in a failing grade. Late submittals will be penalized 1/3 grade per day.

The weekly assignments comprising the first part of the semester will account for 30% of the course grade. In the latter animation projects, you will work towards creating a composite animation, which will account for 60% of the course grade. Course participation constitutes 10%. Projects will be presented in class, for review, during the fifth week and on the final day of meeting. A digital copy of both weekly pieces and final compilation will be required for final grade assignment.

A+ (4.0) = Excellent; exceptional work quality + no missed or late assignments
A (4.0) = Very Good; above average work quality + no missed or late assignments
A- (3.7) = Good; above average work quality + a missed or late assignment
B+ (3.3) = Satisfactory; average work quality + a missed or late assignment
B (3.0) = Marginal; average work quality + missed or late assignment(s)

B- (2.7) = Unsatisfactory; below average work quality + missed or late assignment(s)
C+ (2.3) = Very poor; poor quality + missed or late assignments
C (2.0) = Unacceptable; poor quality + missed or late assignments
C- (1.7) = Unacceptable; poor work quality + missed or late assignments
F (0.0) = Unacceptable; poor work quality + missed or late assignments

Cheating is a serious academic offense and grounds for course failure and/ or school expulsion. Cheating is the use or attempted use of another's material as your own. This includes any idea, image, drawing, or text that is taken from another source, such as an article or online. Any use of ideas or materials must be properly credited by citing the author(s) and source(s). Refer to the *Code of Academic Integrity* for details:
http://www.upenn.edu/academicintegrity/ai_codeofacademicintegrity.html

Pre-requisites

Each core course is a pre-requisite of the one that numerically follows it. The Department of Landscape Architecture will drop

a student from a core Studio, Media or Workshop course if the student has not successfully completed the course in the previous semester or resolved an “Incomplete” grade prior to the start of the subsequent semester, unless special circumstances prevail.

Technical Assistants

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SCHEDULE

Week 1 (Aug. 27-28)	ORIENTATION Course overview Introduction and Review of Geospatial Information Orientation & Warm-up
Week 2 (Sept. 3-4)	GEOSPATIAL DATA MANIPULATION, CONSTRUCTION AND MANAGEMENT 1 Lecture: Divisions of Data GIS – Geodatabases, Raster Manipulation, Feature Class Construction Reading: McHarg's Entropy, Halprin's Chance (Lystra)
Week 3 (Sept. 10-11)	GEOSPATIAL DATA MANIPULATION, CONSTRUCTION AND MANAGEMENT 2 DEM Analysis, Model Builder and Suitability Overlays Assignment #1 – Data Manipulation and Generation Reading: About Typology (Girot)
Week 4 (Sept. 17-18)	ITTERATIVE WORKFLOWS & SITE APPROXIMATION GIS Analytical Tools, Export/ Import Protocols, and Rhino Terrain Modeling Techniques Rhino Terrain, Additional DEM Analysis Assignment #2 - Analytical Surface Systems
Week 5 (Sept. 24)	CULLING, SORTING & MESH ANALYSIS Lecture: Thresholds, Flow, & Pattern Expression Grasshopper – Introduction & Surface analysis Assignment #3 – Terrain Dynamics *Due to Pope Francis visiting Philadelphia, the Friday Section will attend class on the 24th.
Week 6 (Oct 1-2)	PARSING & PARAMETERS Grasshopper-GIS Parsing Terrain analysis and (Data)Tree Manipulations Assignment #4 – Slope & Access (animation)
Week 7 (Oct. 8-9)	FALL BREAK / STUDIO TRIPS
Week 8 (Oct. 15-16)	TURBULENT TRAJECTORIES Grasshopper- Vector Behaviors & Conditional Loops Rain Flow, Accumulation Simulations Assignment #5 – Feedback Flows (animation); Reading: Type? What Type? (Hensel)
Week 9 (Oct. 22-23)	ENVIRONMENTAL EXTENSIONS Grasshopper- Weighting Vector Dynamics Surface Materiality & Roughness, Aspect Assignment #6 – Thickened Sites & Systems (animation)

Week 10 (Oct. 29-30)	MANIPULATION & COLLATION Grasshopper- Profile to Point-Mesh Manipulations Advanced AfterEffects- Effects, Masking, & Composite Compositions Assignment #7 – Terrains & Typological Testing (animation)
Week 11 (Nov. 5-6)	ITERATIVE SYNTHESIS Grasshopper- Nesting Surface Alterations, Iterative Tests, and Graph Bundling Saturation, Erosion/Sedimentation Assignment #8- Differential Dynamics (animation)
Week 12 (Nov. 12-13)	PLANTING PROJECTIONS Grasshopper- Nesting Conditional Loops Forestry simulations (defining iterative suitability, attribute impacts)
Week 13 (*Nov. 19-20)	WORKING SESSION *(THANKSGIVING BREAK. *CLASSES RESCHEDULED)* Course time dedicated to development of final project submission *Course Dates shifted from Thursday 26, Friday 27 to Tuesday 24, Wednesday 25
Week 14 (Nov. 26-27)	WORKING SESSION Course time dedicated to development of final project submission
Week 15 FINAL (Dec. 3-4)	FINAL REVIEW

FINAL SUBMITTAL: CD's with all Assignments and Dynamic-Diagrams Files must be submitted at the Final Presentation to pass this course.