

3D MODELLING

(Specialization Landscape Engineering, 4th Year of study, 1st Semester)

Credits (ECTS): 4

Course category: Specialized discipline

Course holder: Assist. Prof. Ana-Maria-Roxana ISTRATE, PhD

Objectives of the discipline:

The subject "*3D Modelling*" aims to develop student's technical and creative skills using Idea Spectrum Realtime Landscape Architect software to create detailed and realistic three-dimensional models of landscape projects. Students will learn how to design, simulate, and present complex landscape spaces, integrating elements of terrain, vegetation, furniture, and lighting systems to provide sustainable and aesthetically pleasing landscape design solutions.

Contents (syllabus)

Course (chapters/subchapters)
1. Introduction to <i>Realtime Landscape Architect</i> - Presentation of the software interface, essential functions, and main commands; File organization and introductory notions about the workflow in landscape projects.
2. Import and manage 2D plans - Import CAD files and 2D plans into the software to create a working base; Set dimensions and scale the plan to start 3D modeling.
3. Terrain creation and editing - 3D terrain modeling using software tools to create natural landforms, slopes, and plateaus; Terrain manipulation to simulate real site conditions and site analysis.
4. Inserting and configuring vegetation elements - Adding trees, shrubs, and plants to the project using the program's vegetation library; Configuring vegetation parameters (height, age, density) to create a realistic representation of the project.
5. Modeling water features: ponds, rivers, pools - Creating and editing water features such as ponds, rivers, and pools; Adjusting water properties to reflect real conditions (depth, texture, reflections).
6. Inserting and configuring street furniture elements - Adding built elements such as benches, pergolas, pavilions, and other street furniture structures; Customizing sizes and materials to match the landscape design.
7. Road and Pathway Construction - Model roads, alleys, and sidewalks within the project; Configure routes and pavement types to define access and circulation within the landscape.
8. Applying materials and textures to surfaces - Applying textures and materials to the elements created (pavements, facades, roofs); Customize materials to create unique textures and add realism to the project.
9. Setting lighting for landscape projects - Setting up natural (sun, shadows) and artificial (lanterns, spotlights) lighting in the landscape; Simulating day and night lighting to analyze how it influences the design.
10. Creating an irrigation system in 3D model - Designing and configuring irrigation systems for landscape space; Simulating water coverage and planning a resource-efficient system
11. Project rendering for professional presentations - Introduction to rendering techniques to get high-quality images of your 3D project, Setting rendering options, and exporting final images for presentations.
12. Creating animations and virtual tours - Creating animations and interactive virtual tours of the designed space; Setting up visualization paths and camera movements for a dynamic project presentation.
13. Simulating vegetation growth over time - Using the plant growth simulation function to see the evolution of the landscape over time and analyzing the impact that vegetation growth has on the space in the long term.
14. Exporting and preparing the project for collaboration and presentation - Exporting the project in different formats for print, digital, and collaboration (PDF, DWG, video); Preparing a digital portfolio and a set of boards for the final project presentation.

Practical work
1. Getting into the <i>Realtime Landscape Architect</i> interface and importing the site plan - Getting familiar with the program interface and basic commands.
2. Terrain modeling and garden relief configuration - Creating and adjusting the terrain according to the garden's specifics and the site plan's relief.
3. Insertion of vegetation: planting of trees, shrubs and plant beds - Adding and configuring vegetation elements and adjusting the size and density of vegetation according to the landscape plan.
4. Creating and customizing driveways, walkways, and paved areas - Construct driveways, walkways, and paved areas within the garden using different paving types and textures.
5. Inserting and configuring built elements: furniture, pergolas, fences - Adding street furniture elements and structures (pergolas, fences, terraces) into the garden design.
6. Landscape lighting and night lighting simulation - Setting up the garden lighting system and simulating lighting at night.
7. Final rendering and preparing the design for presentation - Making final renderings and exporting the project in appropriate formats for presentation.

Bibliography

- Steven L. Cantor** (2020), *Professional and Practical Considerations for Landscape Design*, Editura Oxford University Press Inc, ISBN 978-0-1906-2333-3;
 - Edward Hutchison** (2019), *Drawing for Landscape Architecture*, Editura Thames & Hudson, ISBN 978-0-5002-9488-8;
 - Slonovschi, A., Prună, L.** (2014), *Infografică. Noțiuni introductive*, Editura PIM, Iași, ISBN 978-606-13-2086-8;
 - Frits 4. Palmboom** (2012), *Drawing the Ground – Landscape Urbanism Today: The Work of Palmbout Urban Landscapes*, Editura Birkhauser, ISBN 978-3-0346-1207-4;
 - Booth Norman**, (2011), *Foundations of Landscape Architecture*, Editura Wiley, ISBN 978-0-4706-3505-6;
 - Thomas R. Ryan, Edward Allen, Patrick J. Rand** (2011), *Detailing for Landscape Architects - Function, Constructibility, Aesthetics, and Sustainability*, Editura John Wiley & Sons Inc, ISBN 978-0-4705-4878-3;
 - Elke Mertens** (2009), *Visualizing Landscape Architecture: Functions, Concepts, Strategies*, Editura Birkhauser, ISBN 978-3-0346-0459-8;
 - Grant W. Reid** (2002), *Landscape Graphics: Plan, Section, and Perspective Drawing of Landscape Spaces – Revised Edition*, Editura Watson–Guptill, ISBN 978-0-8230-7333-7;
- *** Software AutoCAD;
*** Software Realtime Landscaping Architect PRO.

Evaluation

Evaluation form	Evaluation Methods	Percentage of the final grade
Colloquium	Monitoring attendance and activity	20 %
	Final evaluation	60 %
Practical work	Monitoring attendance and activity	20 %

Contact

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3D MODELLING

(Specialization Landscape Engineering, 4th Year of study, 2nd Semester)

Credits (ECTS): 2

Course category: Specialized discipline

Course holder: Assist. Prof. Ana-Maria-Roxana ISTRATE, PhD

Objectives of the discipline:

The "3D Modelling" discipline aims to deepen students' knowledge and skills in landscape design using modern three-dimensional modeling technologies. Students will learn to make complete 3D models of landscapes, using advanced rendering techniques to present and communicate projects to clients and collaborators effectively.

Contents (syllabus)

Course (chapters/subchapters)
1. Evolution of 3D modeling software in landscape architecture 1.1 Historical milestones in the development of 3D software for landscape architecture 1.2 The impact of modeling software on design and visualization 1.3 Evolution of functionality in real-time landscaping Architect and its use in modern landscaping projects
2. Comparative analysis of CAD programs for landscape architects 2.1 The main CAD programs used in landscape architecture (AutoCAD, SketchUp, Realtime Landscaping Architect, Revit) 2.2 Strengths and weaknesses of each software by use 2.3 Analysis of specific functionalities for landscape design tasks
3. Advanced rendering techniques in landscape architecture 3.1 Popular rendering tools (Lumion, V-Ray, Enscape, Realtime Landscaping Architect) 3.2 Photorealistic rendering vs. conceptual rendering in landscape projects 3.3 Success factors for advanced rendering: lighting, textures, reflections
4. GIS integration in landscape design 4.1 Basics of GIS and its use in landscape architecture 4.2 Use of spatial data for landscape analysis
5. Virtual reality (VR) and augmented reality (AR) in landscape architecture 5.1 Differences and complementarity between VR and AR 5.2 Examples of the use of VR and AR in the presentation of landscaping projects 5.3 Benefits and limitations of VR/AR in interaction with design
6. Application of artificial intelligence (AI) in landscaping 6.1 Artificial intelligence in the optimization of landscape solutions 6.2 Predictive models and the automation of design processes 6.3 Examples of AI-based software used in landscaping
7. 3D modeling for sustainable landscape design 7.1 3D modeling for the evaluation of natural resources (light, water, vegetation) 7.2 Using Realtime Landscaping Architect to simulate environmental conditions 7.3 Exercises to optimize ecological impact through 3D simulations
8. BIM (Building Information Modeling) in landscape architecture 8.1 Basic principles of BIM and its role in landscape projects 8.2 Advantages of using BIM for collaboration and data management 8.3 Integration of projects made in Realtime Landscaping Architect with BIM software
9. Drone technology for landscape mapping and 3D modeling 9.1 Use of drones to capture topographical data 9.2 Integrating drone data into 3D modeling software 9.3 Advantages of drones for rapid site mapping and analysis
10. Exploring landscape design through digital terrain modeling (DTM- Digital Terrain Modeling) 10.1 Basics of Digital Terrain Modeling (DTM) 10.2 Importance of DTM in Creating Detailed Terrain Models 10.3 Using the terrain modeling feature of Realtime Landscaping Architect to create accurate reliefs

<p>11. 3D Site Analysis and Environmental Impact in Landscape Design</p> <p>11.1 3D modeling for site analysis (sunlight, wind, water)</p> <p>11.2 Environmental impact assessment through 3D simulations in real-time Landscaping Architect</p> <p>11.3 Using 3D analysis for sustainable landscape planning</p>
<p>12. Integrating 3D modeling into the design of landscape irrigation systems</p> <p>12.1 3D modeling for planning and optimizing irrigation systems</p> <p>12.2 Conservation and efficient management of water in landscape projects</p> <p>12.3 Exercises to simulate water consumption and irrigation coverage using Realtime Landscaping Architect</p>
<p>13. The role of social media and online platforms in learning 3D modeling</p> <p>13.1 Online Resources for Continuing 3D Modeling Learning</p> <p>13.2 How digital communities contribute to the development of 3D modeling skills</p> <p>13.3 Use of Social Platforms for Sharing Knowledge and Portfolios</p>

Project
1. Create and configure a 3D model for landscape design - import 2D plans, set units of measure, and create relief.
2. Application and adjustment of vegetation elements and landscape structures - insertion and customization of vegetation and structures, their adaptation to the site's specific context.
3. Integrating an irrigation system into the 3D model - planning and modeling irrigation systems, adjusting water resources according to vegetation types and terrain configuration.
4. Final rendering of the project and simulation of night lighting - configuration of light sources, simulation of natural and artificial lighting, and realization of final renderings.
5. Presentation and evaluation of the 3D project

Bibliography

- Steven L. Cantor** (2020), *Professional and Practical Considerations for Landscape Design*, Editura Oxford University Press Inc, ISBN 978-0-1906-2333-3;
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- *** Software AutoCAD;
- *** Software Realtime Landscaping Architect PRO.

Evaluation

Evaluation form	Evaluation Methods	Percentage of the final grade
Colloquium	Monitoring attendance and activity	20 %
	Final evaluation	80 %
Project	Monitoring attendance and activity	20 %
	Project presentation and/or support Critical evaluation of a project	80 %

Contact

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