

COURSE CONTENT

Course Code	DT2015
Course Title	Advanced 3D Production
Pre-requisites	DT2001
No of AUs	3
Contact Hours	39 hours studio contact

Course Aims

This intermediate to advanced course provides you the opportunity to expand and refine your knowledge and abilities in the area of 3D digital screen production. You will engage with advanced and alternative processes as you explore and experiment with a range of digital methods such as motion capture, visual effects, real-time animation and rendering, and alternative forms of digital narrative. Each offering of this course will have a unique focus, and will grant you a unique set of skills for future development.

Intended Learning Outcomes (ILO)

By the end of the course, you should be able to:

1. Discuss contemporary 3D digital processes and technique that address specific screen-narrative demands.
2. Develop original digital solutions for unique narrative requirements.
3. Create an innovative production that demonstrates high proficiency with advanced digital processes.
4. Critique the techniques and approaches to the creation of a 3D digital production.
5. Contribute constructively in team-based situations to critique and solve narrative and technical challenges.

Course Content

In this course you will engage with a specific topic of digital 3D production:

- real-time animation and rendering
- motion capture
- visual effects
- alternative forms of digital narrative.

While each year will have its focus, all topics include elements from the other topics. The specific topic for each year will be announced at course advising sessions during course selection events.

Whichever topic you take, you will experience the same innovative and experimental approach as you freely explore your own original expression of 3D digital production. All topics are considered to be intermediate to advanced, and provide you the opportunity to extend yourself into new leading-edge areas.

Real-time animation and rendering

In this topic you will work with alternative 3D animation and rendering processes, using 3D animation and game-engine software. New paradigms of animation, motion, editing and rendering will be explored. Game engine technology is developing rapidly, and offers great potential for new, creative ways to achieve high quality results that compliment current methods of creating digital narratives.

Motion Capture

Motion capture is firmly situated in many industries, such as animation, cinema special effects, digital game design, dance, music, as well as non-entertainment areas such as sports medicine, science, industry and emergency training and many forms of motion study. The course offers the opportunity to extend motion capture into these areas, plus high quality performance and artistic exploration.

Visual Effects

This topic explores the creation of visual things that do not exist. Visual Effects is a broad area that includes dynamics such as fire, smoke and water, automation such as swarms of creatures, or more subtle effects such as the inclusion of anything into video footage in an entirely convincing manner. Visual effects crosses into all aspects of screen production, and is a valuable skill for the future.

Alternative forms of digital narrative

Advanced 3D Production also offers the opportunity to explore and experiment with new forms of narrative. All screen imagery is a story in some way, and the digital medium alters how any story is told and received. In this topic you will explore unique narrative aspects of digital processes such as VR, 360 video, mo-cap, game engine narrative, first-person video, and any digital format or combination available.

Class structure

The first 6 weeks of the course focuses on learning new techniques and processes, how these are applied, and free exploration and experimentation.

The second half of the course focuses on applying the learning to a project that demonstrates high proficiency with advanced digital processes and the application to a meaningful narrative.

Assessment (includes both continuous and summative assessment)

Component	ILO Tested	Programme LO	Weighting	Team/ Individual
Continuous Assessment Process learning tasks Short experiments	1,2,4	--	40%	Individual
Final Project: Advanced 3D process applied to a narrative	2,3,4	--	40%	Individual
Continuous Assessment: Participation	4, 5	--	20%	Individual
Total			100%	

Reading and References

1. *A Boy and his Kite*. Epic. <https://www.youtube.com/watch?v=0zjPiGVSnfl> 2015

2. Pohl, B., Harris, A., Balog, M., Clausen, M., Moran, G., Brucks, R, *Fortnite: supercharging CG animation pipelines with game engine technology*. In Proceedings of the ACM SIGGRAPH Digital Production Symposium, Jul 29 (p. 7). ACM. 2017
3. Gartner, K. *Remote monitoring solution for virtual cameras*, <http://www.kertgartner.com/virtual-cinematography-for-vr-trailers>
4. Unrealengine.com, "SIGGRAPH Recognizes 'A Boy and His Kite' with Best Real-Time Graphics and Interactivity Award" <https://www.unrealengine.com/en-US/blog/siggraph-unreal-kite-best-real-time-graphics-interactivity-award>
5. Unreal Engine, "Unreal Engine SIGGRAPH User Group (official) | Unreal Engine [Retrieved 25 Aug 2017 from <https://www.youtube.com/watch?v=otmxoK4lCNw> 2017
6. Zorthian, J. *How Toy Story changed movie history* <http://time.com/4118006/20-years-toy-story-pixar/> 1995
7. <https://cgsociety.org/>
8. <https://www.unrealengine.com/en-US/blog>
9. <https://www.awn.com/animationworld>
10. <https://www.awn.com/vfxworld>
11. <https://vfx.city/>

Course Policies and Student Responsibilities

(1) General

You are expected to complete all assigned readings, activities, assignments, attend all classes punctually and complete all scheduled assignments by due dates. You are expected to take responsibility to follow up with assignments and course related announcements. You are expected to participate in all project critiques, class discussions and activities.

(2) Punctuality

You are expected to be punctual for all classes. If you are more than 30 minutes late, you will be deemed as absent and will not be able to sign on the attendance register.

(3) Absenteeism

In-class activities make up a significant portion of your course grade. Absence from class without a valid reason will affect your participation grade. Valid reasons include falling sick supported by a medical certificate and participation in NTU's approved activities supported by an excuse letter from the relevant bodies. There will be no make-up opportunities for in-class activities.

Academic Integrity

Good academic work depends on honesty and ethical behaviour. The quality of your work as a student relies on adhering to the principles of academic integrity and to the NTU Honour Code, a set of values shared by the whole university community. Truth, Trust and Justice are at the core of NTU's shared values.

As a student, it is important that you recognize your responsibilities in understanding and applying the principles of academic integrity in all the work you do at NTU. Not knowing what is involved in

maintaining academic integrity does not excuse academic dishonesty. You need to actively equip yourself with strategies to avoid all forms of academic dishonesty, including plagiarism, academic fraud, collusion and cheating. If you are uncertain of the definitions of any of these terms, you should go to the [academic integrity website](#) for more information. Consult your instructor(s) if you need any clarification about the requirements of academic integrity in the course.

Planned Weekly Schedule*

*Subject to adjustment by instructor according to the teaching situation, students' progress, public holidays and unforeseeable circumstances. A revised schedule will be issued to students at the start of the semester.

Week	Topic	Course LO	Readings/ Activities
1	Introduction Introduction to one or more areas of: <ul style="list-style-type: none"> • real-time animation and rendering • motion capture • visual effects • alternative forms of digital narrative. 	1,2,3	Introductory Lecture Overview and discussion on software requirements and skill requirements. Workflow. Overview of class exercises. Introduction to first key software process.
2	3D Production principles Introduction to the topic area via demonstrations and class exercises.	1,2,3	Lecture: Key processes 1 Technical demonstrations with class exercises. Students begin compiling a portfolio of work.
3	3D Production principles Demonstration and class exercises of essential processes and techniques.	1,2,3	Lecture: Key processes 2 Technical demonstrations with class exercises. Students continue compiling a portfolio of work.
4	3D Production principles Demonstration and class exercises of essential processes and techniques.	1,2,3	Lecture: Key processes 3 Technical demonstrations with class exercises. Students continue compiling a portfolio of work.
5	3D Production Application Application of processes and techniques to achieve a visual effects or narrative purpose.	1,2,3	Lecture: Application Applying processes to digital production scenarios. Students explore various techniques in a range of situations in one of the topic areas: real-time animation and rendering, motion capture, visual effects and/or alternative forms of digital narrative.

6	<p>Start of final assignment</p> <p>Definition of topic. Mapping out proposed production. Timeline and predicted workflow. Inventory of skills. Formation of teams.</p>	1,2,3,4	<p>Lecture: Presentation preparation</p> <p>Students explore a range of methods of presenting prototypes.</p>
7	<p>Presentations</p> <p>Presentation of proposed project. Commitment of topic and team structure. Discussions of production approaches.</p>	1,2,3,4	<p>Presentations</p> <p>Student presentations of proposed projects with mock-up prototypes and project management timelines.</p>
8	<p>3D Production</p> <p>Formation of required processes and allocation of responsibilities. Design iterations. Review and feedback.</p>	2,3,4,5	<p>Lecture: From prototype to production</p> <p>An overview of considerations, techniques and process when moving a 3D production from prototype into production.</p>
9	<p>3D Production</p> <p>Final assignment production. Continuous review and feedback of final assignment through various stages of completion.</p>	2,3,4,5	<p>Short Lecture: Production</p> <p>Considerations, potential issues, good working practice, time management, team-work.</p>
10	<p>3D Production</p> <p>Final assignment production. Continuous review and feedback of final assignment through various stages of completion.</p>	2,3,4,5	<p>Assigned Projects</p> <p>Final assignment: Students in studio work. Continuous assessment and feedback throughout production.</p>
11	<p>3D Production</p> <p>Final assignment production. Continuous review and feedback of final assignment through various stages of completion.</p>	2,3,4,5	<p>Assigned Projects</p> <p>Final assignment: Students in studio work. Continuous assessment and feedback throughout production.</p>
12	<p>3D Production</p> <p>Final assignment production. Continuous review and feedback of final assignment through various stages of completion.</p>	2,3,4,5	<p>Short Lecture: Preparation for final presentation</p>
13	<p>Final Presentation</p>	3,4,5	<p>Student Presentations on final assignment with critique and feedback</p>