

Creative Technology module 5b: New Media

1. Education

Creative Technology

2. Module number and name

Module 5b: New Media

3. Module team

- Job Zwiers Module Coordinator
- Jan Koornstra Sound engineering
- Paolo Frasca Mathematic component
- Petri de Willigen Information Specialist
- Job Zwiers 3D modeling, & Game Design

4. Description of the content of the module

The “New Media” module aims at building various skills, learning theory, and understanding techniques, for New Media production. One of the goals is to actually produce New Media products like animated movies or games, using techniques from sound engineering, various graphics techniques, game theory, and narration. It is mostly a “tools and techniques” module where the focus is on creation of New Media while learning theory, experimenting with tools, techniques, and developing skills. The focus is on Sound Engineering, 2D/3D Graphics, Animation, Virtual Reality & Augmented Reality, and Game technology. A major subject of the module is the creation of an animated 3D movie product, where many aspects you learn in this module come together. The courses on Sound Engineering, Virtual & Augmented Reality, and Game Design also ask for smaller scale exercises and products.

Next to this core subjects, students have their own individual Research Project, which aims at deepening knowledge on a New Media related topic of the student’s own choice This Research project also allows him or her to experience scientific exploration, and to build academic skills.

Finally, we have a mathematics track, introducing mathematical knowledge underpinning concepts and techniques for New Media as well as for the mathematical track for the Create curriculum as a whole.

New Media project

A substantial amount of time is invested in the “New Media project”, where the final goal is to create a short animated movie. Skills, techniques, and theory from Sound Engineering, Animation and 3D Graphics are essential, and you have to combine all of these. Although the final movie cannot possibly be very long, you still need to do careful project planning, from first “pen and paper” prototyping and “rough cut” movie scenes to the final rendering and post-processing stages. In between you will be busy creating sound effects, 3D animated characters, and animations.

Game project

The “Game Project” is a smaller scale project where you will produce a 2D game, guided by a series of tutorials or the Unity game engine. You will produce some 2D art, but you also see how a state of the art game engine can be used. You will also work on your programming and scripting skills. The game project is not just programming & modeling. It is based on the practice of game *design*, as explained in the book “The Art of Game Design”, by Jesse Schell. This book explains, in a largely technology independent way, how to start with ideas, essential experience, then continues with game mechanics, game rules, storytelling, aesthetics, iterative development, and game-playtesting.

Virtual Reality& Augmented Reality

There will be a track on a variety of topics, all in the realm of VR and AR, sometimes combined with new ways of interaction by means of robotics. The track will consist of guest lectures, with a lecture in the morning, followed by some hands-on experience for the rest of the day.

Research Project

The individual project is about your (re)search towards your own fascination within the context of Smart Technology. Inspiration can arise from projects in year 1, hobbies, things you think that aren't possible but perhaps they are when you have the right knowledge. You write a research question based on your fascination. This contains the question you want to research and to answer. The project is about going in debt in this research question using literature study. In a literature study you investigate what other scientist have found and achieved regarding your topic. A literature study is useful to know what has been done and investigated so far regarding your question so you don't have to invent the wheel from the beginning. This is an academic skill which will be trained in this module and which will be very useful for your final BSc assignment and future (academic) career. Finally, the student can report his findings both in a written report and via a poster presentation.

Four phases can be distinguished in this project:

Phase 1: Find own fascination and formulate a research question based on this. The research question will be checked and approved by an academic staff member

Phase 2: find a relevant set of key-words in order to perform the literature survey; perform a literature survey and select 3 relevant scientific papers/articles and discuss and summarise this in a report (part 1 of the report). This will be done in close collaboration with the faculty's information specialist.

Phase 3: relate the findings to the research question and based on this come up with new ideas concerning the product, service, idea, concept, etc. in the research question (part 2 of the report).

Phase 4: All findings will be presented both via a written report and via a poster presentation.

Guidance throughout the project phase will be offered by one academic staff member who is allocated to the student based on his research question. In addition guidance will be offered by the information specialist in phase 2 of the project.

Research Project learning goals

At the end of this project the student can:

1. Formulate his/her fascination within the context of Smart Technology

2. Formulate a research question for a product, idea, service based on his/her fascination.
3. Perform a scientific literature research based on his knowledge of all steps in the execution of such research.
4. Deliver a small-scale, defined literature research
 - a. On the basis of key-words related to the research question, search systematically in the scientific literature
 - b. Can select 3 relevant papers or articles from this search
 - c. Can summarise those selected papers in part 1 of the report
 - d. Can perform a relevant discussion based on the findings of the literature survey and the research question and draw relevant conclusions (internal consistency)
5. Come to new ideas for products, services, inventions, etc. based on his/her insights from the literature research (part 2 of the report). These new ideas are related to the own fascination and research question.
6. Present his findings both via a written report and via a poster presentation for his/her fellow students and lecturers.

5. Learning goals of the module and study load for each of the learning goals

The learning goals of the module are partially based on the various individual tracks, but also on integrating knowledge for creating New Media products, as well as a first encounter with scientific research methods, including exploration of scientific literature.

Nr	Learning Goal	EC load
1)	Creating larger scale New Media products	1
2)	Basic theory, skills, and working knowledge of tools, for Sound Engineering	2
3)	Basic knowledge and skills for Computer Animation	1
4)	Skills for creating 3D graphics objects and animated characters	1
5)	Insight in state of the art Virtual Reality and Augmented Reality techniques	1.5
6)	Understanding of basic principles of Game Design	1
7)	Be able to create and implement simple games using game engines like Unity3D	1
8)	Have a working knowledge of mathematical principles for New Media	2
9)	Understand how to explore literature, and how scientific research methods work	2
10)	Practice with techniques for creating multimodal products and applications	2
11)	Reflect about own future profession as a creative technologist	0.5

6. Educational formats within the module

The formats for the module are: lectures, colstruction, exercise sessions, presentations, project work, tutoring, and self-study. The Sound Engineering track has intensive working sessions, in “colstruction” format. Mathematics is similar, using a more traditional lecturing form + exercise based tutorial sessions. The Graphics and Game Design tracks are combined, have somewhat less lecturing, in “colstruction” format, and rely more on written tutorials as well as web based tutorials, which abound for these topics. The VR & AR track consists of a series of (guest-) lectures, where part of the day will be used for hands-on experience or small scale experimentation. The New Media project is naturally mostly based on self-study, but a regular meeting on weekly basis is incorporated. The Research project will see some guest lecturing, but is mostly based on self-study with feedback from tutors. The division of lecturing/colstruction, tutorials/exercises, and tutoring is as follows:

Week	Lectures/colstruction	Tutorials/exercises	Tutoring
1	14	8	2
2	12	4	2
3	14	8	2
4	14	8	2
5	16	8	2
6	14	8	2
7	14	8	2
8	14	8	2
9		2	

The total amount of scheduled lectures, tutorials, and tutoring amounts to 190 hours, leaving a total of 230 hours for self-study, project work, writing reports, and preparation for tests.

7. Course descriptions of the components

- Sound engineering aims at knowledge and skills for producing audio within media productions. A second goal is to reach a level where you can communicate effectively and efficiently with professional sound engineers, audio producers, composers, and Foley artists in a future work environment. There are separate exercises for learning specific skills, but one of the goals is also to produce the sound, and sound effects, for the New Media project.
- Graphics Modeling & Animation teaches mainly skills and some more fundamental insight in 2D/3D graphics modeling and rendering techniques as well as basic animation techniques for humanoid characters for movies or games. It is using the Maya modeling tool, already used in the first year. Most of the knowledge here is quite independent of this particular tool, however. The main focus is on typical work flow for creating 2D or 3D models, characters, character rigging & skinning, animations, materials, lighting, and rendering. A limited amount of theory for 3D graphics will be presented, especially for the technology that underlies materials, lighting, and rendering. This track also contributes a lot to the New Media project (the “movie”)

- The Virtual & Augmented Reality track consists of a series of guest lectures. The idea is a kaleidoscopic overview and short introduction into equipment, interfacing, and applications that can be created using such techniques.
- Game Design aims at basic insight in designing New Media experiences like games, in a technology independent way. This part, based on the book “The Art of Game Design” by Jesse Schell starts with techniques that are fundamental for many different sorts of New Media products, including games, animated narration, movies, interactive installations. It then continues with more game specific topics like design of game mechanics, interfaces, aesthetics, multiplayer aspects. An important part for our course is the material on play testing and user evaluation. The course also teaches how to create a simple 2D game, where the focus is on the necessary programming skills, and where basic insight from Schell’s book can be put into practice.
- Mathematics for New Media is a course offering various mathematical skills that support the technology that is used within New Media production. A Subject like Fourier transforms are in particular useful for the Sound Engineering track.
- The Research Project is meant to work on academic skills, including exploration of literature, writing, reporting, summarizing. It also allows student to investigate something of their own interest in more depth.

Study material.

The module’s course rely on a few books, and a lot on written tutorials, handout materials, as well as web-based tutorials. The books used are:

- The Art of Game Design: A book of lenses. Jesse Schell, Morgan Kaufmann.2008, ISBN 978-0-12-369496-6
- Skill Sheets, 2nd Edition, Rob van Tulder, Pearson Benelux BV, 2012, ISBN-13-9789043023139
- Finish Your Film! Tips and Tricks for Making an Animated Short in Maya, Kenny Roy, Focal Press 2014, ISBN-13: 978-0415661812. Available as printed book, as Kindle book, and as iTunes book.

8. Assessment and assessment criteria

The assessment for the module is based on

- Results for individual tracks on Sound Engineering, VR and AR techniques, Graphics, Mathematics, and Game Development
- A New Media project, where a 3D movie is produced
- The Research project
- Tutoring

The **research project** and the **tutoring** are individually graded, projects are joint work by student pairs, mathematics is again individually graded. The **research project** will be graded on the basis of a written report and a poster presentation. The **portfolio course** will have a pass/fail test.

The **mathematics course** will be graded on the basis of two tests, with the possibility for a resit near the end of the module.

The **Sound Engineering, VR & AR track** and **Game Development** tracks have individual assessments and grading, based on a final product together with a written report. **New Media project** will be

assessed and graded by a small team of teachers. The project will be graded on the product delivered, with substantial contributions from Graphics, and Sound Engineering, as well as project skills. A written report is part of the grading for this project.

The **portfolio** will be judged on the following criteria: active participation in both the individual and group tutor meetings; a representative update of the portfolio at the end of the quartile; contribution in the group meeting on the poster presentation session.

The research project includes a poster presentation, judged by the person advising the student for this project. Both project and portfolio are graded via “rubrics” and numerical grades rounded to one decimal will be given for each component.

Module grading

The module as a whole is based on a weighted average of seven partial results:

Component	weight	minimum result	EC
1. Sound Engineering exercises	13%	5	2
2. Mathematics for NM	13%	5	2
3. Game Development & VR	26%	5.5	4
4. 3D Graphics & Animation project	35%	5.5	4.5
5. Research Project	13%	5.5	2
6. Portfolio	0%	Pass	0.5

All individual topics will have grades rounded to 1 decimal. The final module grade will then be the weighted average of these individual results, and finally rounded to a whole number.

9. Evaluation plan

Formal evaluation of this module will be done by:

- The CreaTe Evaluation Committee (CREEC). They will organize three times a panel discussion with a group of participating students in this module. Two evaluations will be done during the module and the final one is after the module has finished.

- There will be a formal UT questionnaire at the end of the module.

Informal evaluation will be done by the teachers in this module. Half-way the module a written questionnaire will be planned accompanied with individual talks with the students.