Art & Science Visualization

Applied Media Design - Curriculum

Master of Arts
Duration: 4 Semesters
Programme Number: 066776

Amended version of the curriculum, in compliance with the Senate`s decision
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1. Point of departure and prospects

In the last few years, a renewed interest in collaborations and convergences between science and art can be seen, and it appears to be more mutual than ever. Artists' heightened preoccupation with the sciences in the 1920s and 30s is well known; this significantly affected the emergence of the modern in architecture, design, and visual art. In the 1960s a second wave had causal influence on the development of electronic music, video art, and interactive art.

Science's growing interest of late in artistic production processes and methods has numerous reasons. On the one hand, new findings in physics (experimental quantum physics), biosciences (genetics in particular), and brain research have put the dogma of strict deductive analytical methods of research partially into question and reveal definite parallels between scientific and artistic developmental processes. On the other hand, it is becoming clear in precisely these most innovative scientific branches that images are often a necessary requirement for the advancement of scientific research strategies. Visualisation is becoming the basis for further work on new theoretical levels.

Conversely, art has always seized new technologies in order to make use of them as new media for artistic work: from the development of diverse printing techniques, to metal and plastic technologies, film and photography, and ultimately the "new media" of the information technology revolution. Imaging techniques still today titled "new media", in the form of photography, video, and digital computer technologies, are in the meanwhile decades-old technologies, which have opened up new possibilities for art. Current and emerging technological procedures are establishing new dimensions for scientific research in "invisible" realms of micro- and nanoworlds. Biotechnology, imaging techniques for exploring micro- and nanostructures, as well as the connection of temporal and spatial dimensions represent still widely unused media potentials for art. It seems that it is not without reason that art – which Walter Benjamin once called the governor of utopia – threatens to lose to science ever more power to affect the definition of progress. The fact that biomechanical and genetic engineering procedures could be the next generation of artistically applied "media" can be evaluated in different ways. Hence a comprehensive discussion on the potential artistic and societal impacts of these future media in a university context is important and necessary.

Especially for an art university like the Angewandte, whose founding mission advocates social development stimulated by art - fostered not least through the connection between contemporary art and the latest technology – it is particularly appropriate to, once again, be the first art institution to tread new paths. The Wiener Werkstätte, the development of Kineticism in the fine arts, the leading role in the development of Austrian video art, digital art, and net art, as well as the renewal in architecture that was only possible through the application of the latest technology – these are all aspects of the University of Applied Arts' history. And through the "Applied Media Design – Art & Science Visualization" master programme and its inherently fundamental connection between artistic-scientific research, teaching, and practice, this history will continue to be written.

The result is the interlinking of science and art on a content and organisational level, beginning with the focus on new visualisation strategies in research, teaching, and the development of art. For the content, this implies the appropriation of new visualisation technologies as artistic media and their application in artistic works – thus for the art market, for the communication of art and culture (teaching, museums, exhibitions), and for scientific research. Organisationally, this means the launch of a new inter- and transdisciplinary master degree programme in "Art & Science Visualization" for students with an artistic and/or scientific background.

2. Profile

The objective of the "Applied Media Design – Art & Science Visualization" master degree programme is to create synergies between different visualisation cultures and their respective cognitive and research methods for model and theory construction in art and science; the aim is to stimulate interaction between them and to identify innovative potentials by means of an inter- and transdisciplinary approach and project-oriented teaching. Convergent lines, points of contact, and relevant differences – also in retrospect on the relationship between art and science in media history, among other things – shall deepen the understanding of the opportunities that are currently evolving through new instruments, whereas diversity and difference should be made productive. By means of science visualisation, things and processes beyond the bounds of direct human perception become visible documental evidence: everything that is too small (down to the subatomic level), too large (up to the vastness of the cosmos), too fast (certain physical, biological, or chemical processes), too slow (e.g. the passing of seasons), and what lies outside the wavelengths of directly visible light (infrared, ultraviolet, microwaves, etc.).

With their prior scientific/artistic knowledge and the creative ability to develop and apply visualisation strategies procured in the "Applied Media Design – Art & Science Visualization" master degree programme, graduates will be capable of supporting and facilitating either
- scientific or
- artistic research and developmental processes.

Their professional paths may lead to either
- scientific research laboratories of universities, non-university research institutes, and research companies,
- independent, art-market-oriented artistic activity, or
- collaborations with ateliers of visual artists, media artists, designers, or architects.

3. Scope, duration, and structure of the programme

The programme consists of a workload of 120 ECTS credits and lasts four semesters.

It is not defined by a strictly predetermined curriculum, rather it is open and project-oriented: In the first two semesters, foundations will be laid for the project that evolves into the master thesis by the end of the fourth semester. The individual focus of the programme, the balance and relationship between art and science, the software systems required for experiments and production, and the related aesthetic questions are co-determined by the students through their choice of projects and, in particular, the topic of their master thesis.

The first semester is structured as an introductory phase. It will provide a general overview and a first introduction to all of the content comprised in the programme.

In the following semesters, the emphasis is on individual interdisciplinary project work. The programme concludes with a master thesis.

The final assessment of the programme is the product of the assessments in the following modules:
- Interdisciplinary Practice / Art & Science Visualization Project Work
- Art & Science: Methods of Transdisciplinary Research and Applied Representation Techniques
- Master Thesis

Course breakdown per module:

Interdisciplinary Practice/Art & Science Visualization Project Work

Course	Type	SH	ECTS
Art & Science Visualization Interdisciplinary Practice	KO	2	8
Art & Science Visualization Interdisciplinary Project Work 1	PA/KO	2	12
Art & Science Visualization Interdisciplinary Project Work 2	PA/KO	2	12
Art & Science Visualization Interdisciplinary Project Work 3	PA/KO	2	12

Art & Science: Methods of Transdisciplinary Research and Applied Representation Techniques

Course	Type	SH	ECTS
Methods and Practices of Experimental Cultures	VO	2	2
Applied Visualization Cultures	VO	2	2
Transdisciplinarity and Representation I/II	VU	5	8
Science Visualization I/II	VU	4	6
Apparative Techniques of Science Visualization	VU	1	2
Model Building Methods	VU	3	5
Introduction to Programming	VU	2	3
2D/3D Computer Graphics I/II	VU	6	9
Art & Science Interdisciplinary Theory Seminar I/II	SE	4	10
Free Elective	VO/VU	2	3

Master Thesis

Course	Type	SH	ECTS
Master Thesis			24
Master Thesis Tutorial	KO	2	2

SH = Semester Hours

4. Admission prerequisites

The “Applied Media Design – Art & Science Visualization” master programme is an artistic study in accordance with § 54, para. 1, no. 3 of the Austrian University Act 2002.

Prerequisites for admission are proof of artistic aptitude in the framework of the entrance examination pursuant to § 76 of the University Act 2002, and graduation with a domestic diploma or bachelor degree, or foreign equivalent, in the fields of visual arts, media art, design, architecture, natural or computer sciences.

5. Types of courses

VO Lectures
Serve the purpose of knowledge transfer and introduce the student to the important parts of the subject, its structure, and main contents.

VU Lecture and Exercise
A combination of lecture and exercise. The number of participants may be limited.

PA Project Work
With special emphasis on enabling independent work on coherent topics and problems. The number of participants may be limited.

KO Tutorials
Serve the purpose of in-depth artistic/scientific discourse for the realisation of project work and stimulate independent artistic/scientific investigations. The number of participants may be limited.

PA/KO Project Work and Tutorial
A combination of project work and tutorial.

SE Seminars
Serve the purpose of in-depth artistic/scientific exploration of a special section or aspect of a subject. Independent performance is expected from the participants. Limited number of participants.

Free Elective
A free elective course for 3 ECTS credits serves the purpose of independent specialisation within the profile of the programme and can be selected from those provided by all recognised domestic and foreign universities and institutions (pursuant to § 78, para. 1 of the University Act 2002). The free elective is not restricted to the first semester and can be completed at any time within the four programme semesters.

6. Curriculum

1st Semester	Type	SH	ECTS
Art & Science Visualization Interdisciplinary Practice	KO	2	8
Methods and Practices of Experimental Cultures	VO	2	2
Transdisciplinarity and Representation I	VU	3	5
Science Visualization I	VU	2	3
Introduction to Programming	VU	2	3
2D/3D Computer Graphics I	VU	4	6
Free Elective	VO/VU	2	3

2nd Semester	Type	SH	ECTS
Art & Science Visualization Interdisciplinary Project Work 1	PA/KO	2	12
Applied Visualization Cultures	VO	2	2
Transdisciplinarity and Representation II	VU	2	3
Science Visualization II	VU	2	3
Apparative Techniques of Science Visualization	VU	1	2
Model Building Methods	VU	3	5
2D/3D Computer Graphics II	VU	2	3

3rd Semester	Type	SH	ECTS
Art & Science Visualization Interdisciplinary Project Work 2	PA/KO	2	12
Art & Science Visualization Interdisciplinary Project Work 3	PA/KO	2	12
Art & Science Interdisciplinary Theory Seminar I	SE	2	6

4th Semester	Type	SH	ECTS
Master Thesis			24
Master Thesis Tutorial	KO	2	2
Art & Science Interdisciplinary Theory Seminar II	SE	2	4

SH = Semester Hours

7. Entrance regulations

7.1. Entrance examination

7.1.1. The entrance examination involves the assessment of exceptional visual talent, the ability to apply this talent through digital media technologies, and the ability to link this visual talent with scientific processes.

7.1.2. Registration for the entrance examination takes place upon submission of a portfolio of independently produced sample work from preliminary studies as well as a letter of motivation with an accompanying curriculum vitae.

The entrance examination consists of three phases:

- The first phase includes the assessment of the artistic and/or scientific sample work prepared by the candidate.
- The second phase consists of a written test on creative tasks in the fields of art and science.
- In the third phase, the candidate's aptitude for the programme is reviewed in a personal interview.

7.1.3. The entrance examination is only considered to be successfully completed when a positive assessment is granted in all three phases.

7.2. Art & Science Visualization Interdisciplinary Project Work

7.2.1. The main subject of the study programme is dealt with in the context of "Art & Science Visualization Interdisciplinary Project Work". This objective of this project work is to develop and realise visualisation strategies.

7.2.2. Normally, the project work is to be collectively conducted by two to four students, whereby careful attention is paid to ensure that the individual contribution of each student is recognisable.

7.2.3. In the execution of this project work, the students are supervised as a group by a number of university teachers (project supervisors) from various disciplines. This supervision is provided in the framework of the accompanying tutorial for each of the project work courses 1, 2, and 3. Each tutorial is conducted collectively by the appointed project supervisors. The assignment of the topic of the project work takes place at the registration for the tutorial that accompanies the project work. Students can propose a topic in the form of a written project concept.

7.2.4. Admission to project work is only possible once all of the prescribed courses in the 1st semester – with the exception of the free elective – have been completed successfully.

7.2.5. The project supervisors are responsible for the assessment of the project work.

7.2.6. Upon application by the programme coordinators, the appointment of the project supervisors is the responsibility of the administrative body for study law pursuant to § 19, para. 2, no. 2 of the University Act 2002. University teachers from other universities can also be appointed as project supervisors upon their written consent.

7.3. Programme coordinators

7.3.1. For the planning of the content and organisation of the programme and examination services, the rector must appoint an artistic and a scientific programme coordinator. They make decisions in mutual agreement. In the case of conflict, the administrative body for study law makes the decision pursuant to § 19, para. 2, no. 2 of the University Act 2002.

7.3.2. The programme coordinators are appointed for an indefinite period of time. A dismissal is possible.

7.3.3. University professors of an artistic or a scientific subject can be appointed as programme coordinators.

7.3.4. Programme coordinators can also be supervisors of projects and master thesis.

7.4. Master thesis

7.4.1. The programme is completed with the master thesis.

7.4.2. The master thesis consists of the development, the realisation with media technology, and the theoretical foundation of a visualisation strategy in Aran artistic or scientific field of application.

7.4.3. The master thesis is supervised by one or more university teachers with venia docendi in the framework of an accompanying tutorial. Upon application by the programme coordinators, the appointment of the supervisors takes place through the administrative body for study law pursuant to § 19, para. 2, no. 2 of the University Act 2002. The students have a right of proposal.

7.4.4. Two students can conduct a master thesis together when it is authorised by the programme coordinator and in agreement with the supervisors, and when the contribution of each student is recognisable.

7.4.5. Following a public presentation of the results by the students, the master thesis is to be assessed by an examination commission comprised of three university teachers from the field. In any case, the supervisors are members of the examination commission.

7.5. Final Examination

7.5.1. The final examination consist of the subjects “Interdisciplinary Practice/Art & Science Visualization Project Work” and “Art & Science: Methodes of Transdisciplinary Research and Applied Representation Techniques” as well as of the completion of the master thesis.

7.6. Academic degree

7.6.1. For the successful completion of the programme, proof of successful participation in all of the courses prescribed in the curriculum and the approval of the master thesis are required.

7.6.2. Upon successful completion of the programme, the student is awarded the academic degree “Master of Arts” (MA).

8. Entry into force

8.1. This curriculum entered into force on 1 October 2010.