MODULE 5 - PERFORMATIVE SPACE AND TECHNOLOGY (M5, P) (ART_BA)

Due to maintenance, Moodle will be unavailable on Saturday, January 20th, from 20:00 to 21:00.

Announcements

Topic 1

Semester framework theme

The semester project on 2nd semester will focus on the creation of installations for and artistic interventions in selected spaces at Naturmødet (*the Nature Meeting)* that takes place in Hirtshals from the 24th to the 26th of May 2017. Naturmødet is an annual event, where a wide array of stakeholders meet to discuss, debate, inform, educate and inspire about topics related to nature. The specific theme for the Naturmøde of 2018 is “Past and Future” there is an expected audience of approx. 18.-20.000 visitors. Hjørring Kommune organizes the event. http://naturmoedet.dk

Hirtshals is a town situated on the north west coast of Jutland and is dominated by a ferry terminal that connects Denmark and Norway and an industrial harbour. The city is home to the Nordsø Oceanarium, a larger aquarium that showcase the wild life of the North Sea.

The landscape around Hirtshals is characterized by the sea, beaches, wind, and a hilly in-land landcape including some forests.

The semester projects of ArT2 must take two main aspects into account:

1. The context of Naturmødet. The event has a festival-format, so all installations must take this special experiental context into account. A festival site is a temporary, pop-up space, that is created for a relatively short event, with a busy and themed program. That means that the installations or interventions should communicate clearly to the audience, to make a mark in the chaotic the setting. The installations will be temporary artefacts, that are commissioned with a special set of purposes in mind: they should be in dialogue with the design ideas of the Nature Meeting, and contribute to the creation of interesting and meaningful spaces and experiences, that will add to the atmosphere at Naturmødet. The installations or interventions should be an enhancement of the already existing spaces at the nature meeting, which means that they must take their outset in the spatial possibilities that the spaces offer.

2. The content of Naturmødet. The overall themes of *Nature* and *Past and Present*, will be the starting point of explorations of design principles such as bio-mimicry and bionic design. The aesthetic choices in construction, materials, and aesthetics must be developed from inspiration from nature (plants, animals,

natural phenomena) found in and around Hirtshals.

The installations must, of course, live up to the title of the semester: Performative spaces and technology. A performative space is here understood as a space that performs: the space itself has intearctive or responsive features that can react on the environmental conditions, which can be light, wind, touch, human presence, etc. (Kolarevic and Malkawi 2005)

The students will be presented with four pre-defined spaces or challlenges to choose from:

- Informal meeting places, to be placed in the town. Combination of seating + artistic content. Smaller, installations that combine furniture and artistic content.
- Artistic staging of lounge-area next to the Life-Stage. A small urban space, in the town and festival center.
- Enhancement of a green path to the Learning Stage. The green path is a short promenade that leads to the Learning Stage. “Enhancement” could be a series of small objects on the green walls and/or interactive sound and light.
- Enhancement of the wooden steps between the harbour and the city. The steps are an overseen passage that needs to be made visible and invite the audiences to use it. This could be done through light, various forms of installations, etc.

More groups can work on the same spaces/challenges.

The spaces and challenges described above, all have some functional/spatial aspects to work on (seating, way finding, durability) and some artistic-aesthetic aspects to work on (experiences, atmospheres, staging of the spaces)

Groups will be formed based on the students interests in sites/ideas/social preferences. In 1-2 supervision seminars during February, idea development will take place in pre-defined groups. After these sessions the students will be asked to write a list of ideas, sites and 2 preferred collaborators that they would like to work with, and these wishes will inform the basis of the groups, put together by the supervisors.

The role of the semester

Performative Spaces and Technology introduces the students to construction of spatial experiences, and creating works for specific urban or architectural spaces and contexts.

Academic progression

The semester is in most aspects a continuation and expansion of the topics taught in 1st semester. The attention is directed away from the isolated sculptural object to a spatial experience in a more challenging out-door and festival-like context. Most courses follow this progression: BEII, Perception II, while DRI introduces to the use of the laser cutter and AAMII focus on artistic and academic methods for analysing and constructing space and spatial experiences.

Semester organisation and time schedule

As the semester projects must take their departure in the context and content of Naturmødet, lectures on site analysis, site – specificity, creation of spaces in AAM II will deal with these topics. Perception II will focus on perception of space and installation spaces.

Any installation is the result of a strong idea of what kind of experience and impact the work should give to the viewer. In order to ex press such an idea in an installation it is necessary to have an understanding of both technical and contextual elements and also of an individual aesthetic understanding of shape, which is going to be developed further this semester. The artistic development of the form of the installations and research for possible solutions will be trained in AAM II and in DR1 where 2D and 3D constructions methods will be presented as tools for realization of the semester projects.

The technical aspects of the performative spaces will be taught in the module PID II and the course BE II, where programming, sensors and actuators and basic electronics relevant for out - door projects are central topics.

It is expected that report writing will take place throughout the semester, and simultaneously with the artistic parts of the project.

External collaboration:

During the semester students will be dialogue with and receive input from the organizers of the Nature Meeting. That include:

- An introduction to the Nature Meeting and the experience design ideas that inform the planning of the whole event by experience designer Rasmus Kolind Bang at the semester start 01.02.2018
- A one-day-trip to Hirtshals to document and analyse the sites and find inspiration for bio-mimetic designs. (date to be confirmed)
- A pitch session with participants from the Nature Meeting, either in Aalborg or in Hirtshals the 18th of April. After the pitch session, the Nature Meeting will decide which groups that will be invited to show their projects at the event.

Semester coordinator and secretary assistance

Semester coordinator: Line Marie Bruun Jespersen

Secretariat assistance: Anne Nielsen

Topic 2

Module title, ECTS credits

Performative Space and Technology

20 ECTS

Location

2. Semester

Module coordinator

Line Marie Bruun Jespersen

Type/Method and language

Group and project work

English

Learning objectives:
The objective of Module 5: “Performative Space and Technology” is to introduce space as an artistic medium for the creation and construction of artefacts and events within the field of art and technology.

During this module, students should acquire:

Basic knowledge about
· physical installations and performative urban environments and their visual and spatial effects
· architectural aesthetic expressions, interaction between people, space and technology, choice of materials and visual effects
· the application of technology in connection with the creation and use of performative spaces
· methods and tools to be used in the creation of performative spaces from idea to completed project

Skills in
· identifying and formulating an art problem within thetheme “Performative Space and Technology” and developing alternative concepts for a defined problem
· developing and describing artistic and architectural concepts within the theme “Performative Space and Technology”
· the application of appropriate technologies in regard to design and use of performative spaces

· producing sketches, models and prototypes of spatial form

Competencies in
· describing and analyzing architectural spaces and their social, emotional and per formative aspects
· producing concepts for spatial installations of artistic quality
· communication the final design in texts, drawings, and models

Academic content

The basis of this module is human experiences in relation to architectural and performative spaces. Students work with mechanical and technological means in the creation of spatial and performative experiences. Experiments will be made with various technologies, tectonic and architectural principles for the creation of spaces, physical spatial structures and experiential environments.

Students work theoretically and experimentally with realizations of spatial installations including the transformation of space into interactive or otherwise performative architectural environments.

Scope and expected performance

20 ECTS credits. 1 ECTS credit = 27,5 hours of work. 20 ECTS = 550 hours of work consisting of preparation for course sessions, course participation, group work, exercises, counselling and exams.

Topic 3

ARTISTIC AND ACADEMIC METHODOLOGY II (INSTALLATION, ARCHITECTURAL SPACES AND URBAN DESIGN) (M5, C) (ART_BA)

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Artistic and Academic Methodology II: Installation, Architecture Spaces and Urban Design

AAMII is an intensive course that covers various strategies in space/site registration, ways of experiencing space, and includes tools and techniques for visualizing the empiric material and results in the form of drawings, diagrams, maps, photos, videos and sound.

The course is organized as a series of workshop-days that focus on historical theoretical notions of site, site specificity, space and place. Edward W. Sojas concept of "Thirdspace"": time, space and the social will be introduced as a system of thought in terms of space and spaces.

The students will gain experience with methods and approaches to be able to analyse, read and discuss space and place. The Danish harbour city, Hirtshals, in Thy, Northern Jutland, will be used as context and site, in relation to the main semester assignment and the thematic design scope of Biomemecry in the production of public art installation concepts.

AAM II, 2 ECTS = 55 hours

Teaching hours. 8x45min = 6 hours
Workshop activities, Instructions 8x45min = 6 hours
Workshop activities, mapping, analysis etc. = 23 hours
Preparation, reading, seminar = 20 hours

The course cover 2 ECTS comprised of 4 Lectures, 3 Workshops and 1 seminar.

Session 1: Lecture 1: Introduction to site, site specificity, space and place

Session 2: Workshop 1: Space and the creation of spatial experiences

Session 3: Lecture 2: TimeSpace – History, site and time.

Session 4: Workshop 2: Mapping place making, time, histories and memories of Hirtshals

Session 5: Lecture 3: Social Spaces in architecture and urban environments

Session 6: Workshop 3: Social art spaces for Naturmødet in Hirtshals

Session 7: Lecture 4: Biomemecry - nature as generative component in urban environments

Session 8: Seminar: Pin-up and presentation of group assignments in plenum

Announcements

Attendance Record AAMII

Session 1: Lecture 1: Introduction to site, site specificity, space and place

This lecture will give an introduction to phenomenological and formal analysis of architectural and urban spaces, based on the writings of Kevin Lynch, Gordon Cullen, Rob Krier and Francis D. Ching,

The lecture will introduce to different concepts for creating space and provide a vocabulary and tools with which to analyze, assess and define space. Spatial experiences such as: a space to stay in/ a space to pass through/a route to follow/a point de vue,/atmospheres as well as the use of “space-makers” such as physical objects, light, rhythms and sounds will be explored.

The lecture also introduces to ´how to read the city´, i.e. the legible city and urban architecture analysis, focusing on Lynch´s text “Image of the City”, Cullens *Serial Vision* and Kriers insights into space configuration.

Lecturer: Jakob Borrits Sabra

Literature

	Pri. lit. no of p.	**Sec. lit. no of p.**	**Dig. upload**
Kevin Lynch: The Image of the City. MIT Press 1960 pp. 46-49	3		x
Gordon Cullen: The concise townscape. Architectural Press 1961 Pp. 17	17		x
Rob Krier: Urban Space. Academy Editions London. 1979. Pp. 15-62	38		x
Ching, Francis.D.K.: Form, Space and Order, 4th ed. Wiley. 2015 Organization pp. 197-242 Circulation pp. 252-294	45+42		x

Session 1: Literature

Session 2: Workshop 1: Space and the creation of spatial experiences

Workshop

The students will be assigned case studies that must be analyzed and presented to the other students both on the course blog and in a presentation in the final lecture. The workshop session begin with an introduction to the assignments and the requirements for the deliverables. Keywords: defining space, creating space, spatial experience, mapping space.

Students will visit the sites in Aalborg, and collect empiric material in set groups.

Deliverables: The material + results of the analysis is communicated in the form of Serial Visions, Lynch inspired maps, formal analysis of the space configuration of the site in drawings and card board models. All materials must be documented on the wordpress blog before next lecture.

Materials:
For this workshop you must bring:
Camera, paper for notes, pens, paper for drawing, prints of maps of the site (to be found on Moodle). If you have a long measuring tape (10 or 20meters) please bring it.
You must wear WARM and practical clothes according to Danish winter weather, so that you will be able to work and keep warm– you will spend a substantial part of the day outside.

You may have to revisit the site after “hours”; either to experience the site at other times of the day or to collect additional material.

Session 3: Lecture 2: TimeSpace – History, site and time.

In this lecture we will take a brief look at the different concepts Space and Place through the lens of Tim Cresswell before venturing into the writings of Nigel Thrift and John May to understand their 'TimeSpace' - a construction that can help us pay attention to the networks of social time. Social time consist of four inter-related domains of social practices that constitute its multiple spatialities and "senses of time"; timetables and rhythms, social discipline, instruments and devices and texts. From here we will try to practice TimeSpace by investigating the multiple times of the site, the social practices now and then and how it has shaped its surrounding geographies.

Lecturer: Jakob Borrits Sabra

Research the history of selected sites. You can visit Aalborg Historiske Museum or search the two sites in Aalborg Stadsarkiv for historic maps and
photos. http://www.aalborgstadsarkiv.dk/AalborgStadsarkiv.asp?Menu=AalborgStadsarkiv&Menu2=AalborgStadsarkiv_AalborgStadsarkiv

Literature

	Pri. lit. no of p.	Sec. lit. no of p.	Dig. upload
Tim Cresswell: Place. A short introduction. Intro pp. 1-10	10		x
John Urry: Sociology Beyond Societies. Times. Kap. 5 pp. 105-130	25		x
Nigel Thrift: Timespace. Introduction pp. 1-20	20		x

Session 3: Literature

Session 4: Workshop 2: Mapping place making, time, histories and memories of Hirtshals

Workshop

The students will be assigned case studies that relate to time and history, which must be analyzed and presented to the other students on the blog. Students will visit the sites in Aalborg, and collect material for their analysis in groups.

The material + results of the analysis is communicated in the form of photo montages, sound montages, video works or site writings.

Materials:
For this workshop you must bring:
Dictaphone, video camera (Smartphones can do both sound/video), camera, paper for notes, pens, paper for drawing, prints of maps of the site (to be found on Moodle). You must wear WARM and practical clothes according to Danish winter weather, so that you will be able to work and keep warm– you will spend a substantial part of the day outside.

Lecturer: Jakob Borrits Sabra

Session 5: Lecture 3: Social Spaces in architecture and urban environments

Lecture

The lecture will introduce to different ways of observing and describing the social/lived space and provide a vocabulary and tools with which to analyze, assess and define social space. Concepts such as Public domain, Public spaces and life style domains will be introduced and discussed in an art context. Various methods for observation and mapping of the social life in the city will be introduced.

Lecturer: Jakob Borrits Sabra

Literature

	Pri. lit. no of p.	Sec. lit. no of p.	Dig. upload
Hajer & Reijndorp, 2001: In search of new public domain, NAI publishers, Chap 1: Introduction, pp.1-17	17		x
Gehl, J., 2007: Changing public space for a changing public life, in Open Space - People Space, Taylor & Francis, pp. 3-9	6		x
Travlou, P., 2007: Mapping Youth Space in the Public Realm in Open Space - People Space, Taylor & Francis, pp. 71-81	10		x

Session 5: Literature

Session 6: Workshop 3: Social art spaces for Naturmødet in Hirtshals

Workshop

The students will be assigned case studies that must be analyzed and presented to the other students. *Keywords:* Lived spaces and identity in Hirtshals.

Students will read and study perceptions of Hirtshals based on gathered empirical research materials, and use this knowledge to conceptualise artistic interventions and physical artefacts for chosen Hirtshals sites and spaces.

Deliverables: The material + results of the analysis is communicated in the form of visual and written material.

Lecturer: Jakob Borrits Sabra

Literature

	Pri. lit. no of p.	Sec. lit. no of p.	Dig. upload
Lange, I. S. G. (2016). Transit- eller leveby? Et casestudie af Hirtshals som et stærkt mobilitetspåvirket sted i Gennemfartsdanmark, Aalborg Universitetsforlag. Ph.d.-serien for Det Teknisk-Naturvidenskabelige Fakultet, Aalborg Universitet, DOI: 10.5278/vbn.phd.engsci.00076, Kapitel 10 - At kende Hirtshals, pp.169-190	21		x

Session 7: Lecture 4: Biomemecry - nature as generative component in urban environments

Lecture

This lecture will introduce biomimicry in design, bionics and architecture. The students will learn from nature inspired works of art, architecture, spatial environments and design objects as well as rules in bio-ecological design thinking.

Lecturer: Jakob Borrits Sabra

Michael Pawlyn

Using nature´s genius in architecture

Biomimicry in architctural design

Neo-art noveau

https://germinature.com/2015/09/14/biomimicry-and-the-arrival-of-neo-art-nouveau/

Ernst Haeckel: Art forms of nature

http://www.kuriositas.com/2012/01/art-forms-of-nature-ernst-haeckel.html

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Tomas Saraceno: Conversations on biomimicry

https://arts.mit.edu/modeling-mimicry/

Neri Oxman
http://www.materialecology.com

Neri Oxman, MIT https://www.media.mit.edu/people/neri/overview/

Design at the intersection of technolgy and biology, TED talk https://www.ted.com/talks/neri_oxman_des

Bio-inspired design, Neri Oxman

Neri Oxman On Designing Form

Neri Oxman Interview

Session 8: Seminar: Pin-up and presentation of group assignments in plenum

Seminar

The final session in AAMII is a pin-up session where all site analysis´ are presented to the semester. All groups will present their work; their analysis and their choices in regards to representation/visualisation of the material. The various methods´ potential in relation to this semesters project work will be discussed further.

The group formation process will follow the pin-up-session, as we will identify themes to focus on in the projects, based on the students interests.

Lecturer*:* Jakob Borrits Sabra

	Pri. lit. no of p.	**Sec. lit. no of p.**	**Dig. upload**
Situations.org (Claire Doherty et.al): The new rules of public art. Online: http://publicartnow.com/2013/12/12/the-new-rules-of-public-art/		x	x
Miwon Kwon: Public Art and Urban Identities. Online: http://eipcp.net/transversal/0102/kwon/en		x	x

 Upload Presentation Slides and Materials

Topic 9

Topic 10

DIGITAL REPRESENTATION I - 2D AND 3D CONSTRUCTION METHODS (M5, C) (ART_BA)

Due to maintenance, Moodle will be unavailable on Saturday, January 20th, from 20:00 to 21:00.

Announcements

Attendance - Digital Representation I Lectures

Objectives

The students will learn 3D modelling and 2D CAD drawing to fabricate installation assembly parts to be used later in the main project. The course centers around the design of illuminating artifacts that combine acrylic, cardboard, paper and a light bulp. You must install the program **Rhinoceros** (newest edition) on your computers before the course begins. A free 90 day trial version is available at: https://www.rhino3d.com

Digital representation I - 2D and 3D construction Methods is a course in Module 5: Performative Space and Technology.

Lesson 1: Basic navigation and modelling in Rhino 3D

Workshop

The module will introduce basic tools, modeling operations and workflows in Rhinoceros. The students will have to bring a laptop with Rhino installed and the workshop will be arranged as 'learning-by-doing' sessions. You must install Rhino before the course begins, you could use the following link: http://www.rhino3d.com/download (evaluation (free) or full installation)

Lecturer: Jens Munk Clemmensen

Literature

	Pri. lit. no of p.	Sec. lit. no of p.	Dig. upload
It is recommended that you get familiar with the functions presented in Rhino 5 Training Level 1 Training Guide p. 11 – 47 (http://www.rhino3d.com/download/rhino/5.0/Rhino5Level1Training)	36		

CAD files used in the workshop will be available through moodle before the course

Files

Lesson 2: Modelling and Laser Cutting.

Workshop

Modelling and preparation for laser cutting.Brief description: In this module we will look at how to model complex geometries and how to transform these from 3D objects to 2D curves for laser cutting. The students will have to bring a laptop with Rhino installed and the workshop will be arranged as 'learning-by-doing' sessions.

Lecturer: Jens Munk Clemmensen

Literature

	Pri. lit. no of p.	Sec. lit. no of p.	Dig. upload
We use the Training Guide from Module 1, specifically Chapter 9: Creating surfaces. Rhino 5 Training Level 1 Training Guide p. 162 – 196 (found at: http://www.rhino3d.com/download/rhino/5.0/Rhino5Level1Training) CAD files used in the workshop will be available through moodle before the course.	34		

Files

Lesson 3: CAD-CAM

Lecture

This lecture will look at the basic aspects of working between the digital space in Rhino and the production of physical prototypes through CAM machinery. The student will be introduced to several case studies that will showcase the potentials and limitations of 2D production and how they deal with subjects like uniqueness, repetition, numbering, interlocking assemblies, joints, material behavior, etc.

Lecturer: Jens Munk Clemmensen

Literature

	Pri. lit. no of p.	Sec. lit. no of p.	Dig. upload
"Digital Design and Manufacturing – CAD/CAM Applications in Architecture and Design"; Schodek, D.; page: 237-255	18		

Files

Lesson 4 – 5 – 6: Joints

Workshops

This workshop will deal with the design of joints through hands-on work with physical models. The student will work with different joining techniques and learn how altering the joint can alter the potential design space of the final product. The student will also learn how to use a laser cutter and how to tweak the settings of this machine to get a desired output.

Lecturer: Jens Munk Clemmensen

Literature

	Pri. lit. no of p.	Sec. lit. no of p.	Dig. upload
"Digital Design and Manufacturing – CAD/CAM Applications in Architecture and Design"; Schodek, D.; page: 297-312	15		

Lesson 7 – 8: Assembly.

Workshops

Applying the knowledge of "joint design" from the previous workshop the student will work with the design of a complete object. Focus will be on the creation of several iterations of the same design so as to force the student to explore and optimize the design within aspects such as structural integrity, assembly logics, formal expression, functionality, etc.

Lecturer: Jens Munk Clemmensen

Literature

	Pri. lit. no of p.	Sec. lit. no of p.	Dig. upload

"Digital Design and Manufacturing – CAD/CAM Applications in Architecture and Design"; Schodek, D.; page: 297-312.	15

Topic 7

Topic 8

Topic 9

Topic 10

PERCEPTION IN THEORY AND PRAXIS II (M5, C) (ART_BA)

Due to maintenance, Moodle will be unavailable on Saturday, January 20th, from 20:00 to 21:00.

Course description

The purpose of the perception course is to work with concepts of space from different theoretical and practical angles with perception as the experiential centre. The students will work theoretically as well as practically with concepts of space and spatiality. Through the course students will get a basic understanding of the various paradigms of perception in relation to space, navigation and spatial relations and the theories introduced will have its outset in psychological and anthropological approaches to space and place. Students will work with assignments during the course. Assignments and documentation of work must be uploaded in the moodle space.

Perception II is a course in Module 5: Performative Space and Technology

Lecturer: Bo Allesøe

Announcements

Lecture 1: perception of space and space of perception

This lecture will introduce the students to the perception of space and place, the different philosophical and scientific views through history.

	Prim. Litt.	Secund. Litt.	Digital upload
Pop, D, 2013: Space Percetion and its Implication in Architectural Design, Acta Technica Napocensis: Civil Engineering & Architecture Vol. 56, No. 2 (2013)	11		x
Agnew, John, Space and Place, in The Sage Handbook of Geographical Knowledge, chap. 23, pp. 316-331	15		x

Keefe & Nadel (1978) Remembrance of Places Past: a history of theories of space p.1-61	61		x
Sum	87		

Lecture 2: Space and aesthetics

This lecture will introduce to different understandings of space/place, perception and aesthetics

	Prim. Litt.	Secund. Litt.	Digital upload
Bohme, G. (1993). Atmosphere as the Fundamental Concept of a New Aesthetics. Thesis Eleven 36(1): 113-126 (Tilgængelig via AUB)	13		x
Ingold, T. (2000) Stop, Look and Listen! In *The Perception of the Environment*. Routledge. S. 243-287	44		x
Sum	57		

Lecture 3: Introducing the Aesthetic Walkabout

This lecture will introduce to the idea of an aesthetic walkabout drawing on both psychogeography as well as anthropological and sociological understandings of wandering. The lecture will end with an assignment for the students to be presented in the next lecture

	Prim. Litt.	Secund. Litt.	Digital upload
Coverly, Merlin, 2006: Psychogeography, Pocket Essentials, pp. 9-31	20		x
Ingold, T. (2000) Culture on the ground. The world perceived through the feet. In *Being Alive. Essays on movement,*	17		x

knowledge and description. Routledge, pp. 33-50			
De Certeau, M. (1984) Walking in the city. In *The Practice of Everyday Life*. Univerity of California Press, pp. 91-111	20		x
Sum	57		

Lecture 4: Art and Space

We will end this lecture course with a hermeneutical/phenomenological perspective on art and space, thematizing distance and proximity...

	Prim. Litt.	Secund. Litt.	Digital upload
Heidegger, M. (1969) Art and Space. Man and World (Vol. 6, pp. 3–8).	6		x
Figal, G. (2010) Space. In *Aesthetics as Phenomenology*. Indiana University Press, pp. 183-222	39		x
Crowther, P. (2007) Space, place, and sculpture: working with Heidegger. Continental Philosophical Review, 40: 151-170 (Accessible through AUB)	19	x	
Sum	45	19	

Topic 5

BASIC ELECTRONICS II (M5, C) (ART_BA)

Due to maintenance, Moodle will be unavailable on Saturday, January 20th, from 20:00 to 21:00.

Basic Electronics II

The goal of Basic Electornics II is to advance your expertise in working with electronics in relation to interactive artworks. We will look at how you can power your projects when there is no wall power socket available, and how you can protect your components and circuits for outdoor installations. Furthermore, we will look at different types of electrical noise and how to deal with it by filtering the signals.

To support this semester's theme, we will also expand on how to use different lights in your installations and how you can control them with a microcontroller.

The course will cover:

- How to weather proof electronics for outdoor use
- How you can get power when there is no wall power socket available
- Dealing with noise and how you can filter noise from your signals
- Expanding the capabilities of the Arduino in terms of the amount of sensors and actuators you can connect.

The course assumes that you have knowledge of basic electronics. If the basics concepts cause problems, it is recommended that you revisit the curriculum of *Basic Electronics I* or have a look at the many online resources available, e.g.:

http://www.electronics-tutorials.ws/
http://www.allaboutcircuits.com/textbook/

All lectures will be followed by exercises that will help you apply the theory.

Lecturer: Kasper Skou Ladefoged

Semester Coordinator: Line Marie Bruun Jespersen

Participants: ArT2

Basic Electronics II is a course in Module 5: Performative Space and Technology

Literature

	Pri. lit. no of p.	Sec. lit. no of p.	Dig. upload
Make: Electronics, 2nd edition			

ISBN-13: 9781680450262 *(same as PID1)*	X		no
Arduino Cookbook, 3rd edition *ISBN-13: 9781491903520* *(same as S&A2)*	X		no
Additional web based literature will be procided for each lecture.		X	

Announcements

Lesson 1: Electronics Recap and Batteries

The lecture will start with a electronics recap to make sure everything from *Basic Electronis I* is understood and fresh in memory. Afterwards, we will continue to look into power sources and especially what you can do when there is no wall power outlet available and you have to rely on batteries, solar power, etc.

Literature

- **Recap: Make: Electronics, 2nd edition, by Charles Platt (2015). Chapter 1 and 2**
- https://learn.adafruit.com/all-about-batteries/
- https://learn.sparkfun.com/tutorials/battery-technologies
- https://learn.sparkfun.com/tutorials/how-to-power-a-project

Videos

Batteries - start at 1:48 (24:25)

PID1 Terms Checklist

Lesson 2: Outdoor Installations and Weather Proofing

This lecture will cover how to include electronics, computers, speakers, etc. in outdoor installations while protecting it from rain, wind and sun. We will also investigate some of the constraints for the main projects.

Litterature

- https://learn.sparkfun.com/tutorials/interactive-hanging-led-array (also watch the video)

Lesson 3: Dealing with noise

This lecture will introduce different common sources of signal noise and which precautions you can take to reduce/avoid it. We will look at basic filtering and how to avoid a button press triggering several times when it is only pressed once (button debouncing).

Literature

- Make: Electronics, 2nd edition, by Charles Platt (2015). Experiment 9 and 23
- What is a Filter?

 XYZsOfOscilloscopes

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Lesson 4: Many inputs and outputs

Introduction and experimentation with how you can measure and control many things with a single microcontroller. The lecture will cover how to use multiplexers, shift registers, LED drivers, etc. using an Arduino. It will also include a brief introduction to building your own Arduino to reduce size and cost.

Literature

- **Arduino Cookbook, 2rd edition:**
  - Section 5.8 and 7.7
  - Section 7.9 to 7.14
- **Additional Literature**
  - https://learn.adafruit.com/adafruit-arduino-lesson-4-eight-leds/
  - http://www.instructables.com/id/Multiplexing-with-Arduino-and-the-74HC595/
  - https://www.arduino.cc/en/Tutorial/ArduinoToBreadboard

MODULE 6 - PHYSICAL INTERFACE DESIGN II (M6, P) (ART_BA)

Due to maintenance, Moodle will be unavailable on Saturday, January 20th, from 20:00 to 21:00.

Module 6: Physical Interface Design II

Location

2nd semester, Study board of Art and Technology

Module coordinator

Markus Löchtefeld

Method of work and language

Work in small groups and individual assignments
English

Module content

This module introduces programming and the fundamental concepts in this regard. Furthermore these concepts will be applied on a microcontroller with sensors and actuators, enabling the student to create physical interfaces and interactive artefacts. The topics taught in this module will be used in 3rd semester Programming II and 4 th semester Interactive technologies.

Courses

In connection with the module, courses may be offered within the following areas:

- Programming I
- Sensors and Actuators II

Learning objectives

During this module, students should acquire:

basic **knowledge** about

- programming concepts for interactive systems
- actuating possibilities: servo motors, solenoids, and simple mechanics
- using micro-controllers: interface to the computer, analog/digital input/output
- circuit applications: DC filtering, circuit protection and amplifier
- real-time use of signals (such as ADC/DAC, sampling rate, scaling and filtering)
- related work in software development and the media arts

Skills in

- analyzing use of the basic programming with various sensors and actuators
- synthesizing knowledge in written documentation

Competencies in

- evaluating an artefact with regard to programming, sensors, and actuators

Scope and expected performance

The expected scope of the module in terms of ECTS load. This comprises number of teaching hours, exercises, preparation time, travel activity (if applicable) etc.

5 ECTS = 137,5 work hours pr. student.

The module Physical Interface Design II includes a one week writing period from a set of examination question(s).

The module is completed with

Examination 6

An internal written examination in Module 6: Physical Interface Design II (Fysisk interface design II)

Form of examination: c)

The examination is a 7-day assignment on a set subject.

Number of pages: the written part must not exceed 5 pages.

Evaluation: pass/fail. One examiner evaluates the assignment. In case of a Fail grade, an additional examiner will also evaluate the assignment.

Substitution: the examination may be substituted by satisfactory and active participation in courses, i.e. 80% attendance and submission of all assignments set during the course.

Credits: 5 ECTS

The examination should demonstrate that the student has fulfilled the objectives outlined above.

 Announcements

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Topic 1

PROGRAMMING I (M6, C) (ART_BA)

Due to maintenance, Moodle will be unavailable on Saturday, January 20th, from 20:00 to 21:00.

Programming I

Programming I is the first in a series of programming courses meant to teach fundamental concepts of imperative and object-oriented programming using the Processing (Java) language in the context of real-time, multimedia systems. Programming I will introduce you to the foundations of imperative programming: types, operators, functions, and control flow.

Assignments will consist of short-answer and programming homework. Submissions must be in the form of plain-text files (.txt) for written answers and Processing source files (.pde) for source code. If not explicitly stated other formats will not be accepted. For multiple files, submit a single compressed .zip archive file.

All lectures will be followed by exercises that will help you apply the theory.

Lecturer: Kasper Skou Ladefoged

Semester Coordinator: Line Marie Bruun Jespersen

Participants: ArT2

Basic Electronics II is a course in Module 6 - Physical Interface Design II

Software (Required):

Processing

> The students are requred to install Processing, before the first lesson.Installation tutorial can be gound by reading the first section at: https://processing.org/tutorials/gettingstarted/

Literature

	Pri. lit. no of p.	Sec. lit. no of p.	Dig. upload
Processing Tutorials: https://processing.org/tutorials/	X		yes (link)

Programming Interactivity: A Designer's Guide to Processing, Arduino, and Openframeworks. 2nd editon. *ISBN-13: 9781449311445*	32		yes (link)
Reas, Casey. Processing: a programming handbook for visual designers and artists. Second Edition. Mit Press, 2014. *ISBN-13: 9780262028288*		X	yes (link)
Illustrated history of computers: http://www.computersciencelab.com/ComputerHistory/History.htm		X	yes (link)
Comparison of programming languages: http://arxiv.org/abs/1007.2123		X	yes (link)
Mathematics refresher or "Probably All The Math You'll Ever Need" (Langford-Smith, F., editor (1953). Radiotron Designer's Handbook, chapter 6 Mathematics, pages 254–305. Amalgamated Wireless Valve Company Pty. Ltd., Sydney, Australia, 4th edition.)		54	yes (link)

Announcements

LectureNotes

ExampleExam

Lecture 1: Hello World Processing

Topics include Processing Basics, source code and compilation, program structure (the main function), basic output to the console, comments, and "Hello World!".

Literature:

http://hello.processing.org/editor/

Types and Operators

Topics include boolean, floating-point, integer, and string types, variable declaration, statements, scope, and mathematical operators.

Literature:

Read Chapter 2 in *"Programming Interactivity: A Designer's Guide to Processing, Arduino, and Openframeworks. 2nd Edition."*

https://processing.org/reference/

Control Flow

Topics include general program flow, if/else if/else and switch conditionals and iteration with for/do/while loops.

Literature:

https://processing.org/reference/

Functions

Topics include "what is a (mathematical) function?", syntax for declaring, defining and calling functions, and recursion.

Literature:

https://processing.org/examples/functions.html

SENSORS AND ACTUATORS II (M6, C) (ART_BA)

Due to maintenance, Moodle will be unavailable on Saturday, January 20th, from 20:00 to 21:00.

General

Sensors and Actuators II will work with applying programming concepts taught in programming 1 to produce interactive artefacts using microcontrollers. The course requires knowledge of basic electronics, which is applied to connect the microcontroller with sensors (inputs) and actuators (outputs). The course will use the Arduino microcontroller platform to teach these topics.

All lectures will be followed by exercises that will help you apply the theory.

Lecturer: Kasper Skou Ladefoged

Semester Coordinator: Line Marie Bruun Jespersen

Participants: ArT2

Basic Electronics II is a course in Module 6 - Physical Interface Design II

Literature

	Pri. lit. no of p.	Sec. lit. no of p.	Dig. upload
Arduino Cookbook, 3rd edition *ISBN-13: 9781491903520*	X		yes (link)
http://arduino.cc/en/Reference/HomePage *Official references and tutorials for code examples included in the Arduino software package. I would not recommend venturing to the official Arduino playground until after the course.*		X	yes (link)
http://arduino.cc/en/Tutorial/HomePage *Official references and tutorials for code examples included in the Arduino software package. I would not recommend venturing to the official Arduino playground until after the course.*		X	yes (link)

Arduino Comic *A illustrated conceptual and short practical introduction*		X	yes (link)
http://www.ladyada.net/learn/arduino/ *A thorough and very practical introduction complete with schematics, code examples, explanations and exercises.*		X	yes (link)
http://www.jeremyblum.com/category/arduino-tutorials/ *A video series with good explanations on topics ranging from very basic to very advanced. Comes with recommendation from previous students.*		X	yes (link)

Announcements

Lesson 1: Introducing the Arduino

This lecture introduces the notion of microcontrollers. Survey of the Arduino platform, covering the possibilities it offers as well as the limitations it has. We will cover how to program an Arduino, the differences from Processing and good code practices.

Literature

Arduino Cookbook, 2nd edition:

- Chapter 1 (all sections)
- Section 2.1, 2.2, 2.3, 2.4, 2.5, 2.12, 2.19
- Section 7.1

Videos (watch before first lesson)

Lesson 2: Sensing using digital and analog inputs

This lecture covers basic digital and analog (ADC) inputs and how to use sensors with a microcontroller as a first step to creating reactive and interactive systems.

Literature

Arduino Cookbook, 2nd edition:

- Digital Input: 5.0, 5.1, 5.2
- Analog Input: 5.6, 5.7, 5.9
- Serial: 4.0, 4.1, 4.2, 4.3

Videos

Lesson 3: Actuating using digital and PWM outputs

This lecture covers using the digital output and analog output (PWM/DAC) of the Arduino. It will cover how to control different actuators, such as lights, motors, sound, etc. with a microcontroller.

Literature

Arduino Cookbook, 2nd edition:

- Visual Output: 7.0, 7.1, 7.2, 7.3, 7.4, (7.15)
- Physical Output: 8.0, 8.1, 8.2, 8.3, 8.4, 8.8
- Briefly skim / look at the titles of Chapter 7, 8, and 9

Videos

Lesson 4: Communicating with Processing

This lecture covers how you can connect your Arduino to Processing and make simple communication between the two possible.

Literature

Arduino Cookbook, 2nd edition:

- Libraries: 16.0, 16.1, 16.2
- Coding: 2.4, 2.10, 2.14, 2.16
- Serial Communication with Processing: 4.0, 4.1, 4.2, 4.3, 4.4, 4.5, 4.6, 4.7, 4.7, 4.9, 4.15

Videos

MODULE 13 - ART IN CONTEXT II - (M13, P) (ART_BA)

Due to maintenance, Moodle will be unavailable on Saturday, January 20th, from 20:00 to 21:00.

Hovedsektion

Art in Context II - Media Art Theory

Location of module: 4th or 2nd semester

Credits: 5 ECTS

Method of working: Individual work in relation to course activities

Module contents: The module ”Art in Context II” examines media art works and their cultural, aesthetic, social, and technological positions in the 20th and 21st centuries.

Together with Art in Context I, the module introduces the students to the academic and theoretical contexts of the mixed field of Art and Technology. Through different teaching formats such as lectures, workshops, study-trips, and seminars, the students will get acquainted with the methodologies of analyzing media art and digital design artefacts.

Courses:
In connection with the module, courses may be offered within the following area:
- Media Art Theory & Analysis

Learning objectives:

During this module, students should acquire: Basic **knowledge** about
- media art theories and concepts with special focus on cross-disciplinarity and synergy between art and media technology
- various methods of analysis of media art product and projects in regard to their cultural, personal, aesthetic and epistemological significance
- audience and user concepts of media art and the related behavioral and aesthetic preferences

Skills in
- using and applying basic theories and methods in regard to analyses of media art works
- describing artistic challenges and aesthetic formats of media art
- identifying target groups and their behavior and aesthetic preferences in relation to experience potentials of media art works

Competencies in
- applying theories and methodologies of media art
- analyzing and discussing media art works as cultural and aesthetic phenomena
- applying knowledge about user groups and user behavior in analysis and concept design of media art works.

The module is completed with:
Examination 13
An internal written examination in **Module 13: “Art in Context II – Media Art Theory”** (Kunst i kontekst II – mediekunstteori).

Form of examination: c)
The examination is a 7-day assignment on a set subject. The examiner and an additional internal examiner according to 7-point scale evaluate the assignment.
Number of pages: the written work must not exceed 10 pages.

Evaluation: Grading according to the 7-point scale.
Credits: 5 ECTS
The examination should demonstrate that the student has fulfilled the objectives outlined above.

Announcements

MEDIA ART THEORY & ANALYSIS (M13, C) (ART_BA)

Due to maintenance, Moodle will be unavailable on Saturday, January 20th, from 20:00 to 21:00.

General

This course serves as a general introduction to art and technology as a theoretical field of study. As such it continues the trajectory of Art in Context 1, however this semester with a focus on media art before and after the 'digital revolution'. Whereas the theories and humanistic themes of perception, hermeneutics, phenomenology, systems, imagination, and beauty introduced in AiC 1 are still very relevant for the study of art they tend to be challenged and criticized when technology, science and media enters the scene. From this, different theoretical and artistic practices emerge that not only circulate ideas about technology, science and media into critical thinking but also take up new paths of investigations and methods.

The course is structured around eight interconnected lectures focused on giving the students an introduction to different seminal theories, practices and ideas accompanying the still more intensive relationship between art, technology, media and science in the 20th and 21st Century – in short, here, termed Media Art.

Required Texts:

Rush, M. (1999) *New Media in Late 20th Century Art* - Available at Architegn and FACTUM.

Announcements

Topic 1

Lesson 1: Introduction to New Media Art Theory

What is media art theory? What is media studies? How do the two topics relate to the critical study of art and technology? This course will give the student and overview of the most important theories within the expanding field of media art. In this introductory lecture some basic concepts and theoretical problems in the critical study of media art.

Walter Benjamin's seminal text about art in the age of technological reproduction: Authenticity, the subject of technology, and mediated (social) experience. And within this overall new direction of the modern culture, the lecture will also be looking at what aesthetic paradigms are at play in media art.

Combined Lecture: ArT 2 & ArT 4

Lecturer: Elizabeth Jochum

	Mandatory litt. Number of pages	Additional litt. Number of pages	Dig. upload
Rush, M. (1999) *New Media in Late 20th Century Art*: Introduction (pp. 7-35)	28		X
Benjamin, W. (1935) "The Work of Art in Age of Mechanical Reproduction" (trans. Harry Zohn) (pdf)	26		X

Topic 2

Lesson 2: New Materialisms in Media Art History and Theory

Combined lecture: ArT 2 & 4

Lecturer: Elizabeth Jochum

	Mandatory litt. Number of pages	Additional litt. Number of pages	Dig. upload
Rush, M. (1999) *New Media in Late 20th Century Art* Ch 1: Media and Performance (pp. 36-77)	41		
Cubitt, S & Thomas, P. (2013) The New Materialism in Media Art History. (pp. 1-22) (pdf)	22		X

Topic 3

Lesson 3: *The Medium is the Medium*

Marshall McLuhan described the shift from book-culture to electronic media, and his theories are the foundations of media art theory that seek to describe the transition from analog to digital media, and the impact of this transition on the art world, culture, and society at large. McLuhan articulates how digital media have transformed relationships and social organisations in culture and society. Building on the students' prior familiarity with McLuhan (the movement from age of typography to the age of television), we look at the personal sand social consequences of new media and technological tools, investigating McLuhan's assertion that "the clearest way to see through a culture is to attend to its tools for conversation."

Combined Lecture: ArT 2 & ArT 4

Lecturer: Elizabeth Jochum

	Mandatory litt. Number of pages	Additional litt. Number of pages	Dig. upload
Rush, M. (1999) *New Media in Late 20th Century Art* Ch 2: Video Art (pp 78-115)	37		
McLuhan, M. *The Medium is the Message* (excerpt) (pdf)	19		X
Gordon, W. (2014). McLuhan: A Guide for the Perplexed (pdf)		35	X

Topic 4

Aesthetic Theory in use: senses, language, analysis.

A general introduction to aesthetic theory in use; to the experience and analysis of Art in

Context: to the use of the senses (all of them), language and analysis when describing, contextualising, interpreting and understanding art.

The in lessons 8-9-10 you will put theory to use, in class and during our trip to ARoS.

Combined Lecture: ArT 2 & ArT 4

Lecturer: Morten Søndergaard

Literature

	Pri. lit. no of p.	Sec. lit. no of p.	Dig. upload
Dewey, John. Art as Experience . New York: Putnam, 1934. (1, 35-37, 47-48, 106-109, 194-200, 272-275.) On Moodle.	17		Yes
Eco, Umberto (1989): The Open Work, translated by Anna Cancogi, Harvard University Press, pp. 84-104.	20		Yes
Ranciere, Jacques (2009): The Aesthetic Dimension: Aesthetics, Politics, Knowledge. Critical Inquiry 2009, Vol.36(1), pp.1-19. Permalink: http://aub-primo.hosted.exlibrisgroup.com/desktop:Samlet:TN_jstor_csp10.1086/606120	19		Permalink

Topic 5

Lesson 5: Video Art and Theories of Technology, Art and Society

Media technologies are central to contemporary social life, and emergent technologies and media are being developed for a generation that has grown up with the Internet and accelerated development of electronic technologies.

Separate Lectures: 12 March

ArT 2: 10:15-12h

ArT 4: 13:15- 15h

Lecturer: Elizabeth Jochum

	Mandatory litt. Number of pages	Additional litt. Number of pages	Dig. upload
Rush, M. (1999) *New Media in Late 20th Century Art*: Ch 3: Video Installation Art (pp 116-167)	51		
Williams, R. (19XX) The Technology and The Society (pdf)	12		X

Topic 6

Lesson 6: Theories of Interaction in New Media Art

The concept of interaction in media art has developed beyond a purely technological paradigm. What are the principles of interaction and interactive art? How do these principles manifest in public art and public spaces? This lesson looks at the history of interactive art with a focus on first and second generations responsive environments, systems aesthetics, and performative interfaces and spaces created by media artists. We consider contemporary art works and new tools (such as locative media) that promote interaction and immersion, including VR, AR, A-life, and generative computing.

Separate Lectures: 14 March

ArT 2: 10:15-12h

ArT 4: 13:15- 15h

Lecturer: Elizabeth Jochum

	Mandatory litt. Number of pages	Additional litt. Number of pages	Dig. upload
Rush, M. (1999) *New Media in Late 20th Century Art* Ch 4: Digital Art (pp 168-217)	49		
Krueger, M. (1977) Responsive Environments (pdf)	13		X
Kluszczynski, R. (2010) Strategies of Interactive Art	27		X
Jochum & Putnam (2017) Computation as Medium (pdf)		15	X

Zabel, G. (2014) 'Through the looking glass: Philosophical Reflections on the art of virtual worlds' in M. Grimshaw (ed.), *The Oxford Handbook of Virtuality*, New York: Oxford University Press, pp. 407-419. (pdf)

Topic 7

Lesson 7: Remediation

(Elizabeth Jochum)

Remediation: The beginning of the 21st century was marked by the rapid developments of new digital media and rapid response by traditional media (film, print, television) to reaffirm their relevance. This course introduces students to the theories of remediation and hypermediacy, as articulated by Bolter and Grusin, that seek to explain the complex entanglement of processes, tools, and techniques between analog and digital media in the search for liveness and immediacy.

	Mandatory litt. Number of pages	Additional litt. Number of pages	Dig. upload
Bolter, J.D. & Grusin, R. (2000) *Remediation* Ch 1: Immediacy, Hypermediacy, and Remediation (pp.20- 50) (pdf)	30		X
Salter, C. (2010) Entanged. Ch 8: Interaction (pdf)		52	X

Topic 8

Art in Context(s) 2: Excursion to and exercises at AROS

Friday 23 March - ALL DAY

Lecturer: Morten Sondergaard

Combined Workshop: ArT 2 and ArT 4

We will go together in a (most likely - more information will follow) rented bus to Aarhus.

Detailed plan of the day will follow.

Our visit is structured as follows:

1. First, and in continuation of the discussions in the previous lecture, I will give a brief introduction to the use of experience, perception, and language in the analysis of art - the 'works' and their contexts.

2. Assignment: analysing art - in context(s)

The students will then work in groups (sizes to be determined), choosing a specific art work or context to analyse. You will need pen and paper to make notes and maybe sketch!

a. When chosen, start by describing the art work indivudually before discussing it further in the group. Write it down! What words come to mind first when looking and listening to the art work. Use elaborate words that may describe this best!

b. Then present to each other your descriptions. Discuss and construct a collective description - if disagreement note it down and play along with that! Allow words to act as metaphors.

c. Find at least one theoretical source (text) that could help you turn your description into an analysis (i.e Dewey's notion that 'art is the experience of making or encountering the object'). Start by paraphrasing the central theoretical idea and ask the question: where, in the art work you are looking at / listening to / describing could that theoretical idea be helpful to clarify or critically reflect on the artistic idea / representation? (if you have time) Does the art work stand alone or is it depending on contextual constraints for that clarification / reflection to happen?

d. Now, turn your attention to the context. What contexts to the art work do you detect? Are they interacting or opposing each other?

3. Student Presentations

The day will culminate with the groups presenting in front of chosen art works / elements /situations. The presentation and analysis should draw on theories, either from the study in general or the AiC course. It may also include other relevant examples and theories.

Lecturer: Morten Søndergaard

Literature

	Pri. lit. no of p.	Sec. lit. no of p.	Dig. upload
Same as lesson 3 - also including readings from the earlier AiC lessons and your (earlier) semesters in general			

Topic 9

Art in Context(s) 2: Excursion to and exercises at AROS

Friday 23 March - ALL DAY

Lecturer: Morten Sondergaard

Combined Workshop: ArT 2 and ArT 4

Topic 10

Art in Context(s) 2: Excursion to and exercises at AROS

Friday 23 March - ALL DAY

Lecturer: Morten Sondergaard

Combined Workshop: ArT 2 and ArT 4
