

Cybernetics I

Roy Ascott Studio BA in Technoetic Arts

如: SIVA-DETAO ADVANCED CLASS TECHNOETIC ARTS PROGRAM

Place: DeTao Building at Shanghai Institute of Visual Arts (SIVA), Shanghai, China

MODULE DETAILS:

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| Course Title: | Technoetic Arts |
| Module Title: | Cybernetics |
| Module Code: | |
| Year: | One |
| Semester: | One |
| Credits: | 2 |
| Hours/Week: | 2 |
| Hours/Semester: | 38 hours /semester |
| Organizer/Lecturer: Assistant: | Clarissa Ribeiro Sandra Alvaro |
| Building/Room: | DeTao, 12 th Floor, Technoetic Arts Computer Classroom and Regular Classroom |

MODULE DESCRIPTION:

A series of lectures examining the art of interaction in dynamic networks, both natural and artificial, showing the history of the field, and its application to science and society, biology, the arts and communication, with special reference to the root structure of the degree program. The approach includes basic principles such as control, negative feedback, computing, and adaptation, that will be explored as the 'Ariadne's thread' to conduct student explorations that involve the understanding of communication and control in the organization of different systems/organisms, considering 'first order cybernetics' as the main perspective, at this stage.

MODULE LEARNING OBJECTIVES:

At the end of the module the students will be able to:

- Have a clear understanding of concepts as feedback, control and communication in the animal and the machine;
- Be able to develop their own relational approaches by getting involved in the production of the proposed exercises;
- Understand society from the perspective brought by cybernetics;

MODULE OUTLINE:

The classes will be structured by the oriented effort of building producing a series of exercises including practical and theoretical outcomes, that represents/illustrates/embodyes the concepts explored in the classes through the reading/watching and reporting of relevant texts/books/films running in parallel the emergent activity of composing the 'cybernetic diaries' documenting 'inputs' and 'outputs' in the students daily life.

| WEEK | HOURS | CONTENT |
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| 1 | 2 | <p><u>MODULE 1 CYBERNETICS</u> <u>AN INTRODUCTION TO CYBERNETICS</u> <u>CLASS 1</u> (Lecturer: Prof. Clarissa Ribeiro)</p> <p><u>TOPICS:</u> Origins and Pioneers; Communication and control in the animal and the machine; cybernetic and society; biology and computing; information, message, feedback, control; fragmented X integral; the complex system.</p> <p><u>ASSESSMENT:</u> Conducted by the Lecturer, the students will create 'cybernetic IDs' for themselves, having as a reference George Lucas' THX1138 and start mapping, recording inputs and producing outputs in their *Cybernetic Diary (Notebook and PPT): Inputs and Outputs - everyday life of a Technoetic Arts' Fresh Man.</p> |
| 2 | 2 | <p><u>MODULE 1 CYBERNETICS</u> <u>AN INTRODUCTION TO CYBERNETICS</u> <u>CLASS 2</u> (Lecturer: Prof. Clarissa Ribeiro)</p> <p><u>TOPICS:</u> Origins and Pioneers; Communication and control in the animal and the machine; cybernetic and society; biology and computing; information,</p> |

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| | | <p>message, feedback, control; fragmented X integral; the complex system.</p> <p><u>ASSESSMENT:</u> Production of meaningful stencil posters (street art stile) to stamp in t-shirts (cyber uniform) using digital cameras, and Adobe Photoshop. (the students have to manage producing the t-shirts and wear next class)</p> |
| 3 | 2 | <p><u>MODULE 1 CYBERNETICS</u> <u>AN INTRODUCTION TO CYBERNETICS</u> <u>CLASS 3</u> (Lecturer: Prof. Clarissa Ribeiro)</p> <p><u>TOPICS:</u> Ars Combinatoria; Ars magna - The Art operated by combining religious and philosophical attributes selected from a number of lists; Lullian Circle; reasoning as computation.</p> <p><u>ASSESSMENT:</u> Production of <<PSIBERNETIC WHEELS>>, working with 3 different circles containing information related to the understanding of the whole informational body combining the perspectives of KUNDALINI YOGA, TAO AND TCM, PSI;</p> |
| 4 | | <p><u>MODULE 1 CYBERNETICS</u> <u>AN INTRODUCTION TO CYBERNETICS</u> <u>CLASS 4</u> (Lecturer: Prof. Clarissa Ribeiro)</p> <p><u>TOPICS:</u> Ars Combinatoria; Ars magna - The Art operated by combining religious and philosophical attributes selected from a number of lists; Lullian Circle; reasoning as computation.</p> <p><u>ASSESSMENT:</u> Production of <<PSIBERNETIC WHEELS>>, working with 3 different circles containing information related to the understanding of the whole informational body combining the perspectives of KUNDALINI YOGA, TAO AND TCM, PSI;</p> |
| 5 | 2 | <p><u>MODULE 2 CYBERNETICS</u> <u>CYBERNETICS AND SOCIETY</u> <u>CLASS 5</u> (Lecturer: Prof. Clarissa Ribeiro)</p> <p><u>TOPICS:</u> MECHANISM \ THE BLACK BOX: Isomorphic machines; Homomorphic machines; The very large Box; The incompletely observable Box. All watched over by machines of loving grace (poem; BBC documentary)</p> <p><u>ASSESSMENT:</u> "WALL WATCHED OVER BY MACHINES OF LOVING GRACE": poem reading + film session;</p> |
| 6 | 2 | <p><u>MODULE 2 CYBERNETICS</u> <u>CYBERNETICS AND SOCIETY</u> <u>CLASS 6</u> (Lecturer: Prof. Clarissa Ribeiro)</p> <p><u>TOPICS:</u> MECHANISM \ THE BLACK BOX: Isomorphic machines; Homomorphic machines; The very large Box; The incompletely observable Box. All watched over by machines of loving grace (Poem; BBC documentary)</p> <p><u>ASSESSMENT:</u> Producing, in 3 (three) groups of 6 (six) students, new versions for the short movie THX1138 4EB (Earth Born), by George Lucas while studying at USC (University of Southern California) in Los Angeles.</p> <p><u>FILMS:</u> THX1138; THX1138 4EB; All Watched Over by Machines of Loving Grace;</p> |
| 7 | 2 | <p><u>MODULE 2 CYBERNETICS</u> <u>CYBERNETICS AND SOCIETY</u> <u>CLASS 7</u> (Lecturer: Prof. Clarissa Ribeiro)</p> |

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| | | <p>MECHANISM \ CHANGE: Transformation; Repeated change. THE DETERMINATE MACHINE X THE MACHINE WITH INPUT: Coupling systems; Feedback; Independence within a whole; The very large system; STABILITY: Disturbance; Equilibrium in part and whole;</p> <p><u>ASSESSMENT:</u> Producing, in 3 (three) groups of 6 (six) students, new versions for the short movie THX1138 4EB (Earth Born), by George Lucas while studying at USC (University of Southern California) in Los Angeles.</p> |
| 8 | 2 | <p><u>MODULE 2 CYBERNETICS</u> <u>CYBERNETICS AND SOCIETY</u> <u>CLASS 8</u> (Lecturer: Prof. Clarissa Ribeiro)</p> <p>MECHANISM \ CHANGE: Transformation; Repeated change. THE DETERMINATE MACHINE X THE MACHINE WITH INPUT: Coupling systems; Feedback; Independence within a whole; The very large system; STABILITY: Disturbance; Equilibrium in part and whole;</p> <p><u>ASSESSMENT:</u> Producing, in 3 (three) groups of 6 (six) students, new versions for the short movie THX1138 4EB (Earth Born), by George Lucas while studying at USC (University of Southern California) in Los Angeles.</p> |
| 9 | 2 | <p><u>MODULE 2 CYBERNETICS</u> <u>THE COMPUTER AND THE BRAIN</u> <u>CLASS 1</u> (Lecturer: Prof. Clarissa Ribeiro)</p> <p><u>TOPICS:</u> Computation in Neural Nets; The language of the brain not the language of mathematics; Brain waves and self-organizing systems;</p> <p><u>ASSESSMENT:</u> Reflections and discussion about the film Blade Runner in relation to the topic.</p> <p><u>FILM:</u> Ridley Scott's Blade Runner (1982)</p> |
| 10 | 2 | <p><u>MODULE 2 CYBERNETICS</u> <u>THE COMPUTER AND THE BRAIN</u> <u>CLASS 2</u> (Lecturer: Prof. Clarissa Ribeiro)</p> <p><u>TOPICS:</u> TEACHING MACHINES: Adaptive teachers; Descriptive Model; Add listing; Card Pushing; Aptitude testing; Training machines; Teaching machines;</p> <p><u>ASSESSMENT:</u> Alan Turing and John Von Neumann seminars (6 groups of 3 students)</p> |
| 11 | 2 | <p><u>MODULE 2 CYBERNETICS</u> <u>THE COMPUTER AND THE BRAIN</u> <u>CLASS 3</u> (Lecturer: Prof. Clarissa Ribeiro)</p> <p><u>TOPICS:</u> Stafford Beer: From the Cybernetic Factory to Tantric Yoga / FROM OPERATIONS RESEARCH TO CYBERNETICS / TOWARD THE CYBERNETIC FACTORY / BIOLOGICAL COMPUTING / ONTOLOGY AND DESIGN / THE SOCIAL BASIS OF BEER'S CYBERNETICS / THE AFTERLIFE OF BIOLOGICAL COMPUTING.</p> <p><u>ASSESSMENT:</u> Reading Stafford Beer poem and discussing (That green computer sea... nature calculates)</p> |
| 12 | 2 | <p><u>MODULE 3 CYBERNETICS</u> <u>BLACK BOX: A CYBERNETICSTABLEGAME</u> <u>CLASS 1</u> (Lecturers: Prof. Clarissa Ribeiro and Prof. Sandra Alvaro)</p> <p><u>TOPICS:</u> BLACK BOXES: A CYBERNETICS TABLE GAME. The exercise is conceived as a didactic artifice to make the group of students familiar with the main</p> |

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| | | <p>concepts that were teach all along the semester, including feedback, control, input, output, black box, system, self-organization.</p> <p><u>DELIVERY:</u> PLAY "HOUSE ON FIRE" AND DEFINE A PROBLEM</p> <p><u>ASSESSMENT:</u> In couples (9 couples) the students will be supervised by the teachers Clarissa Ribeiro and Sandra Alvaro all along the design process of a table game.</p> |
| 13 | 2 | <p><u>MODULE 3 CYBERNETICS</u> <u>BLACK BOX: A CYBERNETICSTABLEGAME</u> <u>CLASS 2</u> (Lecturers: Prof. Clarissa Ribeiro and Prof. Sandra Alvaro)</p> <p><u>TOPICS:</u> BLACK BOXES: A CYBERNETICS TABLE GAME. The exercise is conceived as a didactic artifice to make the group of students familiar with the main concepts that were teach all along the semester, including feedback, control, input, output, black box, system, self-organization.</p> <p><u>DELIVERY:</u> SEMANTIC PAINELS + DESIGN THE PROBLEM AND ITS EVOLUTION IN TIME</p> <p><u>ASSESSMENT:</u> In couples (9 couples) the students will be supervised by the teachers Clarissa Ribeiro and Sandra Alvaro all along the design process of a table game.</p> |
| 14 | 2 | <p><u>MODULE 2 CYBERNETICS</u> <u>BLACK BOX: A CYBERNETICSTABLEGAME</u> <u>CLASS 3</u> (Lecturers: Prof. Clarissa Ribeiro and Prof. Sandra Alvaro)</p> <p><u>TOPICS:</u> BLACK BOXES: A CYBERNETICS TABLE GAME. The exercise is conceived as a didactic artifice to make the group of students familiar with the main concepts that were teach all along the semester, including feedback, control, input, output, black box, system, self-organization.</p> <p><u>DELIVERY:</u> BUILD THE FIRST PROTOTYBE UNDER SUPERVISION (HAND MADE).</p> <p><u>ASSESSMENT:</u> In couples (9 couples) the students will be supervised by the teachers Clarissa Ribeiro and Sandra Alvaro all along the design process of a table game.</p> |
| 15 | 2 | <p><u>MODULE 2 CYBERNETICS</u> <u>BLACK BOX: A CYBERNETICSTABLEGAME</u> <u>CLASS 4</u> (Lecturers: Prof. Clarissa Ribeiro and Prof. Sandra Alvaro)</p> <p><u>TOPICS:</u> BLACK BOXES: A CYBERNETICS TABLE GAME. The exercise is conceived as a didactic artifice to make the group of students familiar with the main concepts that were teach all along the semester, including feedback, control, input, output, black box, system, self-organization.</p> <p><u>DELIVERY:</u> PLAYING WITH THE FIRST PROTOTYPE TOGETHER WITH THE TEACHERS AND MAKE NOTES.</p> <p><u>ASSESSMENT:</u> In couples (9 couples) the students will be supervised by the teachers Clarissa Ribeiro and Sandra Alvaro all along the design process of a table game.</p> |
| 16 | 2 | <p><u>MODULE 2 CYBERNETICS</u> <u>BLACK BOX: A CYBERNETICSTABLEGAME</u> <u>CLASS 5</u> (Lecturers: Prof. Clarissa Ribeiro and Prof. Sandra Alvaro)</p> <p><u>TOPICS:</u></p> |

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| | | <p>BLACK BOXES: A CYBERNETICS TABLE GAME. The exercise is conceived as a didactic artifice to make the group of students familiar with the main concepts that were teach all along the semester, including feedback, control, input, output, black box, system, self-organization.</p> <p><u>DELIVERY:</u> PRODUCE A DIGITAL VERSION OF THE FIRST PROTOTYPE.</p> <p><u>ASSESMENT:</u> In couples (9 couples) the students will be supervised by the teachers Clarissa Ribeiro and Sandra Alvaro all along the design process of a table game.</p> |
| 17 | 2 | <p><u>MODULE 2 CYBERNETICS</u> <u>BLACK BOX: A CYBERNETICSTABLEGAME</u> <u>CLASS 6</u> (Lecturers: Prof. Clarissa Ribeiro and Prof. Sandra Alvaro)</p> <p><u>TOPICS:</u> BLACK BOXES: A CYBERNETICS TABLE GAME. The exercise is conceived as a didactic artifice to make the group of students familiar with the main concepts that were teach all along the semester, including feedback, control, input, output, black box, system, self-organization.</p> <p><u>DELIVERY:</u> PRINT AND ASSEMBLE THE DIGITAL VERSION AND BRING TO CLASS FOR THE COLLEAGUES TO PLAY AND BE CRITICIZED BY THE TEACHERS.</p> <p><u>ASSESMENT:</u> In couples (9 couples) the students will be supervised by the teachers Clarissa Ribeiro and Sandra Alvaro all along the design process of a table game.</p> |
| 18 | 2 | <p><u>MODULE 2 CYBERNETICS</u> <u>BLACK BOX: A CYBERNETICSTABLEGAME</u> <u>CLASS 7</u> (Lecturers: Prof. Clarissa Ribeiro and Prof. Sandra Alvaro)</p> <p><u>TOPICS:</u> BLACK BOXES: A CYBERNETICS TABLE GAME. The exercise is conceived as a didactic artifice to make the group of students familiar with the main concepts that were teach all along the semester, including feedback, control, input, output, black box, system, self-organization.</p> <p><u>DELIVERY:</u> PRINT THE DIGITAL VERSION AND BRING TO CLASS FOR THE COLLEAGUES TO PLAY AND BE CRITICIZED BY THE TEACHERS.</p> <p><u>ASSESMENT:</u> In couples (9 couples) the students will be supervised by the teachers Clarissa Ribeiro and Sandra Alvaro all along the design process of a table game.</p> |
| 19 | 2 | <p><u>MODULE 2 CYBERNETICS</u> <u>BLACK BOX: A CYBERNETICSTABLEGAME</u> <u>CLASS 8</u> (Lecturers: Prof. Clarissa Ribeiro and Prof. Sandra Alvaro)</p> <p><u>TOPICS:</u> BLACK BOXES: A CYBERNETICS TABLE GAME. The exercise is conceived as a didactic artifice to make the group of students familiar with the main concepts that were teach all along the semester, including feedback, control, input, output, black box, system, self-organization.</p> <p><u>DELIVERY:</u> BRING TO THE CLASS THE FINAL VERSION OF THE PROTOTYPE FOR A COLLECTIVE PLAY AND MAKE A PRESENTATION OF THE PROCESS (5 GROUPS).</p> <p><u>ASSESMENT:</u> In couples (9 couples) the students will be supervised by the teachers Clarissa Ribeiro and Sandra Alvaro all along the design process of a table game.</p> |

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| 20 | 2 | <p><u>MODULE 2 CYBERNETICS</u> <u>BLACK BOX: A CYBERNETICSTABLEGAME</u> <u>CLASS 9</u> (Lecturers: Prof. Clarissa Ribeiro and Prof. Sandra Alvaro)</p> <p><u>TOPICS:</u> <u>BLACK BOXES: A CYBERNETICS TABLE GAME.</u> The exercise is conceived as a didactic artifice to make the group of students familiar with the main concepts that were teach all along the semester, including feedback, control, input, output, black box, system, self-organization.</p> <p><u>DELIVERY:</u> BRING TO THE CLASS THE FINAL VERSION OF THE PROTOTYPE FOR A COLLECTIVE PLAY AND MAKE A PRESENTATION OF THE PROCESS (5 GROUPS).</p> <p><u>ASSESSMENT:</u> In couples (9 couples) the students will be supervised by the teachers Clarissa Ribeiro and Sandra Alvaro all along the design process of a table game.</p> |
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MODULE RESOURCES:

The following book are recommended for this module:

- Ashby, William Ross. An Introduction to Cybernetics. Whitefish, MT: Literary Licensing, LLC, 2012.
- Neumann, John von. The Computer and the Brain: Abused City (The Silliman Memorial Lectures Series. London: Yale University Press, 2012.
- Pickering, Andrew. The Cybernetic Brain: Sketches of Another Future. Chicago: The University of Chicago Press, 2011.
- Turing, Alan. The Essential Turing: Seminal Writings in Computing, Logic, Philosophy, Artificial Intelligence, and Artificial Life plus The Secrets of Enigma. Oxford: Clarendon Press, 2004.
- Wiener, Norbert. Cybernetics, Second Edition: or the Control and Communication in the Animal and the Machine. Cambridge, Massachusetts: MIT Press, 1965.
- Wiener, Norbert. The Human Use of Human Beings: Cybernetics And Society. Boston: Da Capo, 1954.

MODULE ASSESMENT:

Practical and theoretical assignments will be assessed. The entire process will be guided by the Lecturers as conductors, giving the students freedom to discover and build their own strategies in the production of the exercises.

***CYBER UNIFORMS:**

(2,0) complexity of the message;
(2,0) relation to the topic: cybernetics;
(2,0) understanding of the process of emitting/transmitting a message using an specific channel - t-shirt/uniform;
(2,0) organization of the composition allowing clear and easy reading of the message;
(2,0) responsibility in the process of printing and wearing the t-shirt;
total: 10,0 (1st exercise of 5 exercises proposed)

***PSICYBERNETIC WHEELS:**

(2,0) complexity of the information produced related to the understanding of the whole informational body combining the perspectives of KUNDALINI YOGA, TAO AND TCM, PSI;
(2,0) relation to the topic: combinatorial;
(2,0) understanding of the process of combining information to generate meaning in a knowledge process;
(2,0) organization of the composition allowing clear and easy reading of the messages;
(2,0) quality of the finalized wheel produced with card board and simple rotation system;
total: 10,0 (2nd exercise of 5 exercises proposed)

*** THX1138 4EB (production of new versions):**

(10,0) relation to the topic: communication and control;
(10,0) dialogue with the original version of thx1138 4EB short film;
(10,0) creativity in exploring the main arguments in the narrative;
(10,0) quality of the finalized copy and the presentation;
total: 40,0 (3rd exercise of 5 exercises proposed)

*** TURING & NEUMANN SEMINARS:**

(2,0) quality of presentation;
(2,0) relation to the topic: cybernetics and the brain;
(2,0) observation of the main concepts the scientists were working with;
(2,0) quality of the poster(information; composition);

(2,0) quality of videos selected and presented;
total: 10,0 (4th exercise of 5 exercises proposed)

*BLACK BOXES (CYBERNETICS TABLE GAMES)PART 2:

(10,0) quality of the graphic project;
(10,0) quality of the final prototype of the table game;
(10,0) quality of the project (rules, structure);
total: 30,0 (5th exercise of 5 exercises proposed)

MODULE EVALUATION:

Students will be evaluated for attendance, participation, and level of creative and critical reflection shown through their practical and theoretical work assignments.

Total Grading 100