Media and communication technologies have introduced powerful practical and conceptual tools for the Arts, and they have opened up crucial new dimensions to explore art.

Mutation of mediums, means of representation and knowledge transmission, interaction by means of our gestures and senses, the invention of new tools... deeply change the nature, the shape, the contents of artworks, and the way broadcasting and sharing them. Furthermore, it is the process of their creation and the deployment of creativity itself that are changing.

It is crucial that we provide ourselves with the means to play a part in this change.

Hence, the engineer, the researcher and the artist must be involved in it together.

And since new technologies allow for such perspectives, the domains of technological invention, scientific discovery and artistic creation must be able to converge in a same point, within a same 'workshop', and why not be embodied within a same person.

The AST Master Degree is a high-ranked multi-disciplinary course open to students holding a degree in engineering sciences (computer science, signal processing, automatic control engineering, modeling and simulation, acoustics, computer graphics...), willing to address arts in the context of new technologies.

This course aims at giving them a deep understanding of the concepts as well as a strong knowledge of advanced technologies for sound and musical creation, image art, art of visual motion and gesture art, multisensory interactivity...
**CURRICULUM**

**1st SEMESTER**
**THEORY AND PRACTICE (WORKSHOPS) - (30 ects)**

<table>
<thead>
<tr>
<th>Core curriculum</th>
<th>16 ects</th>
<th>h</th>
</tr>
</thead>
<tbody>
<tr>
<td>Technologies and Processes of Musical Creation</td>
<td>3</td>
<td>28</td>
</tr>
<tr>
<td>Technologies of Dynamic Visual Arts</td>
<td>3</td>
<td>28</td>
</tr>
<tr>
<td>Interactive Virtual Reality</td>
<td>3</td>
<td>28</td>
</tr>
<tr>
<td>Analysis and Perception of Multimodal Scenes</td>
<td>3</td>
<td>18</td>
</tr>
<tr>
<td>Advanced Programming for Interactive Creation</td>
<td>1,5</td>
<td>16</td>
</tr>
<tr>
<td>Genetic algorithms for Image and Movement Synthesis</td>
<td>1</td>
<td>12</td>
</tr>
<tr>
<td>Mathematical Methods for Musical Creation</td>
<td>1</td>
<td>12</td>
</tr>
<tr>
<td>Color Synthesis by Modeling of Photonic Interaction with Matter</td>
<td>0,5</td>
<td>6</td>
</tr>
</tbody>
</table>

**2nd SEMESTER (March—June)**
**RESEARCH INTERNSHIP IN A LABORATORY OR IN A COMPANY — (30 ects)**

The AST Curriculum includes a 4 to 6 months training period (full time) in a research team, starting in February. In the first semester, each student chooses a subject from the Master’s Degree partners list. At the end of the training period, the students have to write a report describing their project. This work is evaluated during a public Master’s Thesis Defense.

**Optional classes (2 choices) — 6 ects**

<table>
<thead>
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<th>ECTS</th>
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<tr>
<td>6</td>
<td></td>
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<tr>
<td>Cognitive Psychology</td>
<td>3</td>
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<tr>
<td>Models for Human-Computer Interaction</td>
<td>3</td>
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<tr>
<td>Artificial Intelligence, Artificial Life and Cognition</td>
<td>3</td>
</tr>
<tr>
<td>Musicology</td>
<td>3</td>
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<tr>
<td>Aesthetics and Philosophy of Visual Arts</td>
<td>3</td>
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</tbody>
</table>

**Language — 3 ects**

English or French

**Artwork project**
Musical, Visual and Multisensory Creation

**Upgrading classes (1 choice) - 3 ects**

<table>
<thead>
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<th>ECTS</th>
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<tbody>
<tr>
<td>3</td>
<td></td>
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<tr>
<td>Signal Processing</td>
<td>3</td>
</tr>
<tr>
<td>Computer Science - Programming - Algorithms</td>
<td>3</td>
</tr>
</tbody>
</table>

**ANALYSE**

**PROFESSIONAL SECTOR:**

Cultural Art Centers for Creation
France: National Center for Creation (Lyon, Paris, Marseille...) International: ZKM (Karlsruhe, Allemagne)

Graduate Schools of Arts
France: EESI (Superior European School for Image)
Angoulême – Poitiers

CNNSMD (Lyon, Paris)
International: Cardiff School of Art and Design (UK)

Music Conservatories
France: Grenoble, Lyon ...
International: Turin Conservatory (Italy)
Cuneo Conservatory (Italy)

Companies of Engineering
Systems and Tools for Music, Image and Multimedia

**AFTER THE MASTERS’ DEGREE…**

**RESEARCH:** Thesis in one of the partners laboratories or in a laboratory working on similar topics.

Some examples of thesis:
M. Bernays: ‘Expression and gestural control of the piano timbre’ (dir. Caroline Traube) University of Montréal, Musicology department.

**CORE CURRICULUM**

Research Labs, RESEARCH AND CREATION CENTERS

ACROE (Grenoble)
ICA Laboratory (Grenoble)
GIPSA-lab (Grenoble)
IRCAM (Paris)
IRIT (Toulouse)
GMEM (Marseille)
CNRS-LIMSI (Orsay)
MacGill University (Canada)
University of Plymouth (UK)
Cardiff Metropolitan University (UK)
Aalborg University – Denmark
Lab. IDML, CIRM/M, Univ. McGill, Montreal (Canada)
Institute for Systems and Computer Engineering of Porto (Portugal)
LIAM
GMEM

...SOME PARTNERS LABS, RESEARCH AND CREATION CENTERS

...real-time multisensory simulation platform

...