AST
Art, Science, Technology
Master's Degree – 2010/2011

Ingénierie de la Cognition, de la Création et des Apprentissages – IC2A
(Engineering for Cognition, Creation and Learning)
Grenoble Institute of Technology / UJF / UPMF / Université Stendhal

Digital technologies and computer science introduced powerful practical and conceptual tools for the Arts. They opened up new dimensions to explore in the nature and contents of artistic objects (music, video, multimedia), and in the creation process itself. This evolution implies new kinds of researches and developments that seamlessly integrate scientific and artistic aspects.

*The AST Master's Degree is a 1-year course hosted by the **Phelma** School of **Grenoble Institute of Technology** in Grenoble, France. The Master is open to students holding a degree in engineering sciences (Computer Science, Signal Processing, Automatic Control Engineering, Cognitive Sciences, Physics, Modelling and Simulation, Acoustics, Computer Graphics, …). It proposes a **pluridisciplinary training** in conceptual and technical aspects of **digital technologies for sound and music creation, dynamic visual arts and multisensorial interactivity**.*

The course includes:
- A **core curriculum**: concepts, methods and technologies for Computer Music, Dynamic Visual Arts, Multisensorial Physical Modelling and Gestural Interfaces; Genetic Algorithms for Image and Movement synthesis; Analysis and Perception of Multimodal Scenes, …
- **Refreshers classes in engineering sciences**: Signal Processing, Programming, Algorithms, Computer Systems, Network Management.
- **Options**, chosen by the student according to its profile and professional project: Cognitive Psychology, Models for Human-Computer Interaction, Artificial Intelligence, Artificial Life and Cognition, Musicology, Art History, …
- **Creation workshops,** allowing to experiment the major contemporary computer tools for visual and musical arts.

Having an artistic activity is appreciated, but not necessary.

Job Opportunities:
Research (PhD Thesis) and development in Art-Science-technology. Teaching (Universities, Art Schools, Musical Conservatoires, …). Musical, visual, audiovisual and multimedia production.

Partners:
ACROE, Grenoble ; Lab. **ICA** (Informatique et Création Artistique), Grenoble_INP ; **IRCAM**, Paris ; **IRIT**/UT1 Equipe Synthèse d'Images et Réalités Virtuelles, Toulouse ; **CICM** (Centre de Recherche en Informatique et Création Musicale), Paris VIII ; **GMEM**, Marseille ; Laboratoire Mathématiques appliquées aux systèmes, **Ecole Centrale Paris** ; lab. **SPCL** (Sound Processing and Control Laboratory), Faculté de musique, Univ. McGill, Montréal - Canada ; lab. **LIAM** (Laboratoire Informatique et Acoustique Musicale), Faculté de musique, Univ. McGill, Montréal - Canada…

Information and Application: http://prevert.upmf-grenoble.fr/MasterICA/SpecialiteAST

Director of Studies
Claude Cadoz
+33 (0)4 76 57 46 61
Claude.Cadoz@imag.fr

Secretary and Application
Ophélie Pereyra
+33 (0)4 56 52 92 17
Ophelie.pereyra@minatec.inpg.fr

Programme (Course of last year, to be updated)

Core curriculum

Core curriculum	ECTS	
Technologies and Processes of Musical Creation	3	C. Cadoz
Technologies of Dynamic Visual Arts	3	A. Luciani
Real-time Physical Simulation and Gesture Interfaces	3	J.-L. Florens
Analysis and Perception of Multimodal Scenes	3	J.-L. Schwartz, J. Hérault
Mathematical Methods for Musical Creation	3	M. Andreatta, C. Agon
Neuropsychology and Creativity		I. Viaud-Delmon
Genetic algorithms for image and movement synthesis	3	H. Luga
Software environments for Music	3	O. Tache
Multisensory Interactions, Enaction and Performing Arts		W. Ka

Upgrading classes (1 to choose)

Upgrading classes	ECTS	
Signal Processing	3	G. Feng
Computer Systems and Network Management	3	J-M. Adam, C. Bulfone
Programming	3	B. Caylux
Algorithms	3	J.-M. Adam

Optional classes (2 to choose)

Optional classes	ECTS	
Cognitive psychology	3	S. Rousset, C. Marendaz
Models for Human-Computer Interaction	3	J. David
Artificial Intelligence, Artificial Life and Cognition	3	V. Rialle
Musicology	3	P. Revol
Art History	3	

Langue

Langue	ECTS	
English	3	

Total ECTS for 1ˢᵗ Semester | **33**

Research Training Period

The AST Programme includes a 4 to 6 months (full time) training period in a research team, starting in **February**.

During the first semester, each student chooses a subject among the list proposed by the partners of the Master's Degree.

During the training, **the student integrates the research team and works in the context of its projects**, in close collaboration with Ph.D. students and researchers. His work is directed by a member of the team and monitored by one of the teachers of the Master. The role of this teacher is to make sure that the student's project goes well at the practical and scientific level.

At the end of the training period, the student writes a **dissertation** (around 40 pages), which describes his project, the state of the art in the concerned domain, and clearly states his contribution. This work is evaluated during a public **Master's Thesis Defense**. The defense committee is composed of the Heads of the Master, the director of the training period, and invited members.

Total ECTS for 2ⁿᵈ Semester | **27**