UNIVERSITÀ DEGLI STUDI DI PALERMO

DEPARTMENT	Scienze Umanistiche
ACADEMIC YEAR	2017/2018
MASTER'S DEGREE (MSC)	MUSICOLOGY AND PERFORMANCE STUDIES
SUBJECT	MUSIC COMPUTER SCIENCE - ADVANCED COURSE
TYPE OF EDUCATIONAL ACTIVITY	C
AMBIT	20957-Attività formative affini o integrative
CODE	18404
SCIENTIFIC SECTOR(S)	ING-INF/05
HEAD PROFESSOR(S)	CHELLA ANTONIO Professore Ordinario Univ. di PALERMO
OTHER PROFESSOR(S)	
CREDITS	6
INDIVIDUAL STUDY (Hrs)	120
COURSE ACTIVITY (Hrs)	30
PROPAEDEUTICAL SUBJECTS	
MUTUALIZATION	
YEAR	1
TERM (SEMESTER)	2° semester
ATTENDANCE	Not mandatory
EVALUATION	Out of 30
TEACHER OFFICE HOURS	**CHELLA ANTONIO** Monday 09:00 11:00 DICGIM, edificio 6, III piano

DOCENTE: Prof. ANTONIO CHELLA

PREREQUISITES	No prerequisites are mandatory. A basic knowledge of computer science is suggested at the level of ECDL (European Computer Driving Licence) full standard.
LEARNING OUTCOMES	Learning outcomes according to the Dublin descriptors: - Objective 1: Knowledge and understanding The student will acquire the theoretical knowledge needed to understand the problems related to digital sound generation and processing. The student will study the theoretical foundations and will discuss artistic aspects. The course will include lectures; class discussions; seminars and panels. - Objective 2: Applying knowledge and understanding The student will acquire the functional capabilities necessary to analyze case studies of digital sound generation and processing. He/she will be able to use a system from case studies, to identify the problems, to evaluate the performances of the proposed solutions. The course will include sessions in the lab, or autonomously, by analyzing the relevant case studies. - Objective 3: Making judgments The student will acquire the necessary methodologies to apply digital sound generation and processing systems in a novel way by integrating the notions learned during the class. He/she will be able to analyze problem data at disposal, even if limited and incomplete, and to propose design solutions tailored to the problem at hand. The student will be able to compare strengths and weaknesses of the proposed solutions and to evaluate the performance of the solutions also by their artistic aspects. The course will include analysis and discussion of case studies; presentations performed by students team concerning their projects; preparation of a project. - Objective 4: Communication skills The student will be able to work in a team and to communicate with competence and correctness the issues related to digital sound generation and processing systems. The course will include group sessions in the lab; presentations and class discussions by the students. - Objective 5: Learning skills The student will be able to autonomously learn and study specific problems related to sound digital sound generation and processing systems by the literature of the field. The course will include seminars, panels and class discussion on the main research topics of sound and music computing system.
ASSESSMENT METHODS	Assessment methods will focus on the evaluation of learning outcomes of the course (see below) according to the Dublin descriptors. The final grade will be from 18/30 to 30/30 cum laude. - Assessment of Objective 1: Knowledge and understanding This objective will be evaluated by an oral discussion concerning the technical topics of the syllabus. Objective 1 will count as 10% of the final grade. - Assessment of Objective 2: Applying knowledge and understanding This goal will be assessed by an oral discussion of case studies of digital sound generation and processing analyzed by the student during team sessions in the lab. Objective 2 will count as 10% of the final grade. - Assessment of Objective 3: Making judgments This purpose will be judged by a discussion of a project, prepared at home and in the lab, by the student together with his/her student team. The project will concern the realization of a digital audio track of a pre-set duration, containing sounds generated by digital techniques. The audio track would demonstrate the capabilities of the student to create sounds and music by digital techniques and to process them appropriately. Objective 3 will be evaluated by discussing the technical and artistic choices made. Objective 3 will count as 50% of the final grade. - Assessment of Objective 4: Communication skills This objective will be assessed by the oral discussions concerning Objectives 1,2,3 and by the analysis of the project concerning Objective 3. Objective 4 will count as 5% of the final grade. - Assessment of Objective 5: Learning skills This objective will be evaluated by the discussion of the project described in Objective 3. In particular, Objective 5 will be judged by discussing the theories and techniques learned by the student team and employed in the audio project. Objective 5 will count as 25% of the final grade.
EDUCATIONAL OBJECTIVES	The general topics of Sound and Music Computing are in agreement with the ACM Computing Classification System. In particular, the educational objectives of the course cover all or parts of the Sound and Music Computing 2007 roadmap of the S2S2 (Sound to Sense, Sense to Sound) Consortium, established as Coordination Action by European Commission under 6th FET Open Call: http://smcnetwork.org/roadmap More in details, the lectures of the course will cover the "in-focus content areas" reported in Appendix A of the roadmap, representing the core disciplines of a course in Sound and Music Computing: - Sound Modelling

	- Sound Analysis and Coding - Music Information Processing - Music Performance
TEACHING METHODS	The overall format of the course is: - Lectures - Lab sessions - Class discussions
SUGGESTED BIBLIOGRAPHY	Vincenzo Lombardo, Andrea Valle: Audio e multimedia (Quarta edizione), Maggioli Editore - Apogeo, 2014. Francesco Bianchi, Alessandro Cipriani, Maurizio Giri: Pure Data: Musica Elettronica e Sound Design, Volume 1, ContempoNet, 2016.

SYLLABUS

Hrs	Frontal teaching
2	Introduction to the course. Remarks on digital audio
2	Sampling and quantization, Fourier analysis
2	Sound synthesis, the digital oscillator
2	Control signals
2	Direct digital synthesis
2	Spectral modeling synthesis
2	Source modeling
2	Time based methods
2	Software systems for sound synthesis

Hrs	Practice
2	Examples of direct generation synthesis
2	Examples of spectral modeling synthesis
2	Examples of source modeling
2	Examples of methods based on time domain
2	Examples of audio projects based on sound generation
2	Examples of use of software systems for sound generation