UNIVERSITÀ DEGLI STUDI DI PALERMO

DEPARTMENT	Scienze Umanistiche		
ACADEMIC YEAR	2018/2019		
BACHELOR'S DEGREE (BSC)	ARTS, MUSIC AND PERFORMING ARTS		
INTEGRATED COURSE	HUMANISTIC COMPUTER SCIENCE		
CODE	13563		
MODULES	Yes		
NUMBER OF MODULES	2		
SCIENTIFIC SECTOR(S)	ING-INF/05		
HEAD PROFESSOR(S)	CHELLA ANTONIO	Professore Ordinario	Univ. di PALERMO
OTHER PROFESSOR(S)	AUGELLO AGNESE CHELLA ANTONIO	Professore a contratto Professore Ordinario	Univ. di PALERMO Univ. di PALERMO
CREDITS	9		
PROPAEDEUTICAL SUBJECTS			
MUTUALIZATION			
YEAR	2		
TERM (SEMESTER)	2° semester		
ATTENDANCE	Not mandatory		
EVALUATION	Out of 30		
TEACHER OFFICE HOURS	**AUGELLO AGNESE** Tuesday 08:00 09:00 Aula Seminari C1Il ricevimento e' fissato orientativamente prima della lezione ma e' preferibile fissare degli appuntamenti su richiesta. **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 necessary to understand the problems related to the analysis, design, and implementation of sound and music computing system. The student will thus study the theoretical foundations and the principal topics of current research. Finally, the class will discuss esthetical aspects. The course will include lectures; class discussions; seminars and panels. - Objective 2: Applying knowledge and understanding The student will acquire the practical capabilities necessary to design and implement case studies of sound and music computing system. He/she will be able to develop a system starting from case studies, to identify the problems, to formulate algorithms, to implement and evaluate the performances of the proposed solutions. The course will include sessions in the lab, or autonomously, by analyzing the most critical case studies. - Objective 3: Making Judgments The student will acquire the necessary methodologies to implement and evaluate pure sound and music computing system not previously discussed by the case studies by integrating all the notions obtained during the course. 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 esthetical aspects. The course will include analysis and discussion of case studies; lectures on esthetical elements of sound and music computing system; presentations performed by students team concerning their projects and implementations; preparation of a written essay. - Objective 4: Communication skills The student will be able to work in a group and to communicate with competence and correctness the issues related to the design, implementation, and evaluation of sound and music computing systems. The course will include team sessions in the lab on the design and implementation of pure sound and music computing system; presentations and class discussions by the student's teams. - Objective 5: Learning skills The student will be able to autonomously learn and study specific problems related to simple sound and music computing system 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 systems.
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 assessed by an oral discussion concerning the theoretical topics of the syllabus. Objective 1 will count as 15% of the final grade. - Assessment of Objective 2: Applying knowledge and understanding This objective will be assessed by an oral discussion of sound and music computing case studies analyzed by the student during team sessions in the lab. Objective 2 will count as 15% of the final grade. - Assessment of Objective 3: Making Judgments This objective will be assessed by a discussion of an essay, written at home and in the lab, by the student together with his/her student team. The article will concern the design and implementation of a simple sound and music system. A live demo of the system will have to be shown by the student team. In particular, Objective 3 will be assessed by discussing, in particular, the design and implementation choices performed by the student team. Objective 3 will count as 30% 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 the analysis of the written essay concerning Objective 3. Objective 4 will count as 10% of the final grade. - Assessment of Objective 5: Learning skills This objective will be assessed by means of the discussion of the essay described in Objective 3. In particular, Objective 5 will be assessed by discussing, in particular, the theories and techniques autonomously learned by the student team and employed in the implementation of the sound and music computing system described in the written essay. Objective 5 will count as 30% of the final grade.
TEACHING METHODS	The overall format of the course is: - Lectures - Lab sessions

MODULE
MUSIC COMPUTER SCIENCE

Prof. ANTONIO CHELLA

SUGGESTED BIBLIOGRAPHY	
Vincenzo Lombardo, Andrea Valle: Audio e Multimedia, quarta edizione, Apogeo	
AMBIT	10645-Attività formative affini o integrative
INDIVIDUAL STUDY (Hrs)	120
COURSE ACTIVITY (Hrs)	30

EDUCATIONAL OBJECTIVES OF THE MODULE

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

SYLLABUS

Hrs	Frontal teaching
3	Introduction of sound and music computing
3	Fundamentals of acoustics and sound perception
3	Digital representation of sound and music
3	Audio file compression
3	Sound synthesis
3	Algorithmic composition
3	Musical robotics
3	MIDI protocol

Hrs	Practice
3	Analysis of the software system Audacity
3	Analysis of the MIDI software system MuLab

MODULE
COMPUTER SCIENCE FOR ARTS

Prof.ssa AGNESE AUGELLO

SUGGESTED BIBLIOGRAPHY	
De Santo, Colace, Napoletano. "Informatica per le arti visive, la musica e lo spettacolo". Mc Graw Hill.	
AMBIT	10645-Attività formative affini o integrative
INDIVIDUAL STUDY (Hrs)	60
COURSE ACTIVITY (Hrs)	15
EDUCATIONAL OBJECTIVES OF THE MODULE	
The aim of this class is to introduce students to basilar concepts concerning the digital processing of sounds, images and video. The class will be articulated by mixing up theoretical frontal lessons with practical exercises, supported by open source software.	

SYLLABUS

Hrs	Frontal teaching
3	Data and Information. Binary code. Signals. Digital representation of information.
2	Digital Representation of Images. Resolution. Bit rate. Introduction to Gimp (selection tools, clone tool, Image Scale, Introduction to levels)
3	Digital representation of sounds. Representation formats. Bit rate. Physical and psychophysical characteristics of sound. Isophonic curves. Introduction to Audacity (Select, move and amplify audio tracks)
2	Information processing systems. Turing machine. operating systems, More on Audacity.
3	Image processing. Physics of light. Color theory and digital models of color representation. Manipulation of images through DIE. Change of colors. Color curves. Application of effects and filters.
2	Digital representation of video. Psychophysical characteristics of vision. Assembly and production techniques for video. Examples of DVE. Assembly with chromakey techniques.
3	Description, acquisition and sharing of musical scores. Music XML format. Musescore environment. AnthemScore environment.
2	Computational thinking in art. Recalls of the basic concepts of programming.

Hrs	Practice
1	Creating a Photomontage with Gimp
1	Exercises with Audacity
3	Exercise: Desaturation of Images, Gimp levels. Creation of a small self-ethnographic audio project
1	Exercises with Filmora.
1	Scratch and MakeyMakey Tutorial
3	Creating a "genre shifted" movie trailer