



UNIVERSITÀ DEGLI STUDI DI PALERMO

DEPARTMENT	Matematica e Informatica
ACADEMIC YEAR	2021/2022
BACHELOR'S DEGREE (BSC)	COMPUTER SCIENCE
SUBJECT	EDUCATIONAL METHODOLOGIES AND TECHNIQUES FOR COMPUTER SCIENCE
TYPE OF EDUCATIONAL ACTIVITY	D
AMBIT	10547-A scelta dello studente
CODE	19750
SCIENTIFIC SECTOR(S)	INF/01
HEAD PROFESSOR(S)	EPIFANIO CHIARA Ricercatore Univ. di PALERMO
OTHER PROFESSOR(S)	
CREDITS	6
INDIVIDUAL STUDY (Hrs)	102
COURSE ACTIVITY (Hrs)	48
PROPAEDEUTICAL SUBJECTS	
MUTUALIZATION	EDUCATIONAL METHODOLOGIES AND TECHNIQUES FOR COMPUTER SCIENCE - Corso: MATEMATICA EDUCATIONAL METHODOLOGIES AND TECHNIQUES FOR COMPUTER SCIENCE - Corso: MATHEMATICS
YEAR	3
TERM (SEMESTER)	2° semester
ATTENDANCE	Not mandatory
EVALUATION	Out of 30
TEACHER OFFICE HOURS	EPIFANIO CHIARA Tuesday 14:30 17:00 Dipartimento di Matematica ed Informatica, via Archirafi 34, Room 104, primo piano/ first floor

PREREQUISITES	No prerequisites
LEARNING OUTCOMES	<p>Knowledge and understanding Acquisition of advanced tools for teaching Computer Science at schools, principles and methods for building activities and more generally a Computer science Course consistent with the objectives set by national guidelines for high schools and guidelines for technical and professional institutes. Knowledge of the main misconceptions concerning Programming and of problem solving strategies. Knowledge of the ethical aspects related to the processing of personal data, to the automation of decisions, to legal aspects of Computer Science, such as copyright.</p> <p>Applying knowledge and understanding Ability to apply the presented topics and in particular to design and develop a Computer science course for schools, reflecting the guidelines. Ability to solve problems and to use the specific language correctly.</p> <p>Making judgements During the course a critical approach for learning the exposed subjects is stimulated. Students will be guided to learn critically and responsibly the topics that will be proposed to them.</p> <p>Communication skills Ability to present the involved subjects, even to a non-expert public. To be able to support the importance of the studied theories.</p> <p>Learning skills Ability of being up to date, using the knowledge acquired in the course. The proposed material will develop the learning abilities of the students who will be able to "interrogate" their knowledge-skills in respect of the problems faced.</p>
ASSESSMENT METHODS	<p>The exam consists of an oral test in which the student will show the results obtained thanks to the course, in terms of Knowledge and comprehension, Ability in applying knowledge and understanding, Autonomy in making judgments, Communications skills, Learning ability. This will be done through a portfolio on the activities carried out during the course and a few questions on the course.</p> <p>The assessment is expressed in thirties. In detail, the outcome of the assessment can be described as follows.</p> <p>30 cum laude: excellent knowledge of the topics, excellent language skills, excellent analytical skills, excellent ability to independently apply the knowledge acquired 30: excellent knowledge of the topics, excellent language skills, good analytical ability, good ability to independently apply the knowledge acquired 26-29: Good mastery of the subjects, good language skills, reasonable ability to independently apply the knowledge acquired 24-25: Good knowledge of the main topics, reasonable language skills, with limited ability to independently apply the knowledge acquired 21-23: knowledge of the main topics of teaching but lack of full mastery; limited language skills and ability to independently apply the knowledge acquired 18-20: minimal knowledge of the main topics of teaching and of the technical language, minimal ability to independently apply the knowledge acquired Insufficient: lack of sufficient knowledge of the content of the topics covered in the teaching, no ability to independently apply the knowledge acquired.</p>
EDUCATIONAL OBJECTIVES	<p>The course aims to provide students with concrete and useful tools for teaching Computer Science as a scientific discipline. It can also provide an opportunity to deepen the knowledge of the discipline for those who do not intend to carry out the teaching profession.</p> <p>In particular, we intend to provide a critical analysis of the main teaching methodologies developed for computer science and to illustrate how to construct activities within a curriculum of computer science consistent with the objectives set by national guidelines for high schools and for technical and professional schools. In this context, on the one hand specific teaching topics will be presented, on the other hand there will be introduced techniques to present in an efficient way these topics to school students.</p>
TEACHING METHODS	Lectures during which all the contents of the course will be rigorously presented and analyzed. Some exercises in the classroom allow a better understanding and mastery of the presented topics.
SUGGESTED BIBLIOGRAPHY	<p>Libro di testo/Textbook: "Guide to Teaching Computer Science. An Activity-Based Approach", Orit Hazzan, Tami Lapidot, Noa Ragonis. Springer 2014; ISBN 978-1-4471-6904-8.</p> <p>Libro di consultazione/Reference Book: "Great Principles of Computing", Peter J. Denning, Craig H: Martell. MIT Press</p>

SYLLABUS

Hrs	Frontal teaching
3	Standards of Curricula in computer science
3	Introduction: Informatics/Computer Science
2	Relationship with other disciplines
3	Aspects of Computer Science History
3	Programming languages, Programming paradigms
4	Problem Solving Strategies
3	Visual Programming
4	Scratch
2	Conceptual maps and metaphors
3	Visualization techniques
4	Educational games for Computer Science
4	Algorithms' animation
3	Design a lesson
3	Designing the evaluation: types of questions
2	Informatics and Society, ethical aspects(Personal data treatment)
2	Automation of decisions and recommendations, legal aspects (Copyright)