UNIVERSITÀ DEGLI STUDI DI PALERMO

DEPARTMENT	Scienze Psicologiche, Pedagogiche, dell'Esercizio Fisico e della Formazione
ACADEMIC YEAR	2017/2018
MASTER'S DEGREE (MSC)	PRIMARY EDUCATION
SUBJECT	PHYSICS FOR PRIMARY AND CHILDREN'S SCHOOL WITH LABORATORY
TYPE OF EDUCATIONAL ACTIVITY	B
AMBIT	70010-Discipline fisiche
CODE	16029
SCIENTIFIC SECTOR(S)	FIS/08
HEAD PROFESSOR(S)	BATTAGLIA ONOFRIO ROSARIO — Ricercatore a tempo determinato — Univ. di PALERMO FAZIO CLAUDIO — Professore Ordinario — Univ. di PALERMO
OTHER PROFESSOR(S)	
CREDITS	9
INDIVIDUAL STUDY (Hrs)	156
COURSE ACTIVITY (Hrs)	69
PROPAEDEUTICAL SUBJECTS	16018 - MATHEMATICS FOR PRIMARY AND CHILDREN'S SCHOOL WITH LABORATORY
MUTUALIZATION	
YEAR	4
TERM (SEMESTER)	2° semester
ATTENDANCE	Not mandatory
EVALUATION	Out of 30
TEACHER OFFICE HOURS	**BATTAGLIA ONOFRIO ROSARIO** Wednesday 14:00 17:00 Dipartimento di Fisica e Chimica - Emilio Segre', edificio 18, viale delle Scienze*. (*) In alternativa al ricevimento in presenza e' possibile usufruire del ricevimento in modalita' telematica attraverso l'ausilio della piattaforma Microsoft Teams su apposita stanza virtuale con codice per l'accesso: fqdj47w **FAZIO CLAUDIO** Monday 14:00 16:00 Studio P2030, Dipartimento di Fisica e Chimica, Edificio 18 di Viale delle Scienze, oppure Canale Teams "Ricevimento Prof. Claudio Fazio", codice di accesso: 53tzmt2. Link di accesso: https://teams.microsoft.com/l/team/19%3af5f7dc869cc04aedba96507e0f0f67ba%40thread.tacv2/conversations?groupId=7bdda581-b29b-450f-860b-8835b71d24ce&tenantId=bf17c3fc-3ccd-4f1

DOCENTE: Prof. CLAUDIO FAZIO- *Lettere A-L*

PREREQUISITES	Basic topicsof Mathematics. Basic topics of Classical Physics
LEARNING OUTCOMES	Knowledge and understanding Knowledge and understanding of the basic concepts of physics and mathematics and of the basic teaching methods of scientific disciplines. Applying knowledge and understanding Application of knowledge to solve simple problems of general physics. Application of didactic transposition methods of elementary physical content. Acquisition of skills' necessary for the preparation of a teaching/learning path. Use of the specific language of scientific disciplines. Use of simple instruments for the construction of teaching / scientific experiments. Making judgements Acquisition of metacognitive skills in relation to the level of understanding of physics Application of the more suitable method for solving a physical problem. Evaluation of the effectiveness of a teaching/learning path. Communication skills Being able to deal with a situation from the point of view of physics and explain it in schools, in a clear and correct way, even referring to simple laboratory experiments Organizing a lecture on scientific topics. Presenting the results of experiments performed. Putting into operational situations Primary and Nursery School children. Learning skills Analysing problems different than those studied. Using observed phenomena for teaching basic physical concepts. Adapting the teaching/learning path to the specific class-context.
ASSESSMENT METHODS	The final evaluation is done through a written test, an oral test and a written teaching/Learning path, with final grades expressed in thirty. The written test consists of four or five open questions and exercises on physics topics discussed during the course and is designed to verify the possession of the required skills and abilities. The questions, clear and uniquely interpretable will ask the students to independently formulate a coherent and self-consistent answer and to show the procedures followed. They are structured in a) closed questions; b) open answer that can be judged by means of pre-defined evaluation criteria. A mark is assigned to each answer depending on its full, partial or not correctness. The oral test consists of a discussion, with questions aimed at checking the skills and disciplinary knowledge dealt with the course. The questions take a cue from the written elaborate and from the teachin/Learning path presented and are generalized to other topics covered during the course. They are designed to test the learning outcomes and are aimed at checking a) the student knowledge; b) his/her argumentative and analytic skills, c) his/her presentation skills; d) his/her didactical skills with respect to the physics contents. With respect to the knowledge assessment, the understanding of topics discussed during the course and the ability of establish relationships and make connections among them is mainly verified. With regard to the verification of processing capacity, it is verified if the student: * is able to provide independent judgments about the subject contents; * understands the didactic applications and/or implications of the same in the context of the development of Physics, of its didactics and the related socio-cultural context. The final evaluation will be made on the basis of the following conditions: Score 30-30 and praise: excellent knowledge of the topics, excellent exposition skills, good argumentative and analytic skills. The student is able to fully apply his/her physics knowlwdge to solve the problems proposed. The students is fully able to didactically transpose his/her physics knowledge. Score 26-29: good knowledge of the topics, good exposition skills, good argumentative and analytic skills. The student is able to apply his/her physics knowlwdge to solve the problems proposed. The students is able to didactically transpose his/her physics knowledge. Score 23-25 : decent knowledge of the topics, decent exposition skills, decent argumentative and analytic skills. The student is able to apply his/her physics knowlwdge to solve many of the problems proposed. The students is able to didactically transpose his/her physics knowledge. Score 21-22: acceptable knowledge of the topics, good exposition skills, acceptable argumentative and analytic skills. The student is able to apply his/her physics knowlwdge to solve the majority of the problems proposed. The students is able to didactically transpose his/her physics knowledge.

	Score 18-20: minimal knowledge of the topics, acceptable exposition skills, minimal argumentative and analytic skills. The student is barely able to apply his/her physics knowlwdge to solve the problems proposed. The students is barely able to didactically transpose his/her physics knowledge. Insufficient score: the student does not have an acceptable knowledge of the contents of the topics discussed during the course, is not able to justify their claims and to apply his/her physics knowlwdge to solve at least some of the problems proposed. The students is not able to didactically transpose his/her physics knowledge.
EDUCATIONAL OBJECTIVES	Understanding the basic elements of the experimental method and the physical content needed for teaching in Primary/Nursery School. Acquiring basic manual skills in the organization of simple educational experiences. Designing teaching/learning paths for the Primary/Nursery School. Validate in a context of equal educational courses designed
TEACHING METHODS	Te course is held in the second semester of the fourth year of the Degree Course in Primary Education. The educational activities are performed through lectures on basic physics issues, solving of exercises and problems, development of simple experiments. The Laboratory Section of the Course (1 CFU) is done with the aid of Teachers supervisors of the internship activities and are aimed at allowing students to didactically transpose the topics studied. At the end of the Course two or three days of Science Exhibition is organized in a laboratory of the Department of Physics and Chemistry, during which the students propose experiments and "science games" to children of primary school specially invited.
SUGGESTED BIBLIOGRAPHY	E. Ragozzino: Elementi di Fisica - EdiSES, Napoli D. Allasia, V. Montel, G. Rinaudo: La Fisica per maestri - Ed. Libreria Cortina, Torino Dispense del Docente

SYLLABUS

Hrs	Frontal teaching
2	Physics and Science. Measurement and units. Experimental uncertainties
2	The analysis of the experimental uncertainties. Direct and indirect measurements and propagation of uncertainty .
2	Lenght, surface and volume measurements
2	The concepts of mass and density. Linear relationships between variables.
2	Interactions between bodies and the concept of force. The spring force and the gravity force
2	The laws of Dynamics
2	Momentum and its conservation
2	Energy and work. Kinetic energy and potential energy
2	Conservation of mechanic energy
2	Conservative and dissipative forces. The "extended" energy conservation principle
2	Thermal energy. Temperature and the Thermal equilibriumlance. Kinetic model of temperature. Heat.
2	Specific heat and latent heat. Changes of state.
2	Electricity: electrostatics
2	Electricity: electric current. Electric circuits
2	Magnetism in vacuum and in matter
2	Mechanical waves. Light and its nature
2	Light phenomena

Hrs	Practice
19	Exercises of the topics dealt with

Hrs	Workshops
2	Laboratory: Teaching a scientific discipline. Spontaneous models in children and learning styles. Cooperative learning and use of experimental laboratory in science education
2	Laboratory: Skills' and objectives in a teaching/learning path. Planning a teaching/learning path
2	Laboratory: Preparation of laboratory activities. Use of IT tools for experimental data collection and the related didactical analysis. Modular teaching. skills, training outcomes. O.S.A. Inquiry Based Science Education.
10	Laboratory: Exercises and group work: construction of simple experiments to be performed in the classroom and related teaching/learning paths. Discussion and sharing of results