# Elementary Chemistry (plus Workshop on Elementary Chemistry)

## Prof. Elisa Appiani

***COURSE AIMS AND INTENDED LEARNING OUTCOMES***

The course aims to make the future teacher understand that chemistry also contributes to the achievement of the objectives set by the 2012 National Guidelines for the nursery and primary education curriculum. The course aims to provide students with a general understanding of the methods of scientific investigation and focuses on teaching those elementary notions of chemistry that allow for a scientific interpretation of a good part of everyday phenomena. The objective is also to initiate and/or support reflection on methods that allow students to welcome and stimulate their curiosity about phenomena that can be described in chemical terms, inviting them and leading them to build knowledge through individual and group experimental research.

At the end of the course, the teacher will be able to use the basic chemistry knowledge learnt in class and the experience acquired in the laboratory with the inductive method and the experiential approach; students will also be able to recognise the chemical processes faced in everyday life, and to describe them using accurate scientific terminology; they will be able to actively participate in each phase of the scientific method, recognising the degree of abstraction and the skills required by each phase; they will be able to plan and carry out activities that allow nursery and primary school pupils to actively participate in building their knowledge, starting by directly dealing with phenomena, going through planning, research and experimentation, to get to the elaboration of simple chemical models.

***COURSE CONTENT***

The course explores the following topics from general chemistry, all connected to examples of daily life:

* classification of matter;
* properties of solids, liquids and gases;
* the atom and atomic structure;
* the periodic table and chemical elements;
* physical and chemical transformation
* concept of atomic mass;
* chemical bonds;
* chemical reactions.

The course is supplemented by didactic-workshop activities entrusted to expert conductors, and characterised by specific themes and methodologies agreed upon with the course teacher. Each workshop edition will be aimed at the production of an educational project, the assessment of which will be entrusted to the above-indicated conductor/s on the basis of parameters shares with the course teacher, and based on criteria of: completeness, coherence, originality, didactic value.

***READING LIST***

1) F. Bagatti - E. Corradi - A. Desco - C. Ropa, *Scopriamo la Chimica,* Zanichelli Editore SpA, 2015

2) Aa. Vv., *Percorsi essenziali di Chimica,* Tramontana Editore, 2016

3) M. Arcà - L. Bassino - E. Degiorgi, *Dentro la materia. Una storia di atomi,molecole, particelle*, Carocci editore, 2006

4) J. Tro Nivaldo, *Introduzione alla Chimica,* Pearson Education Italia, 2013.

***TEACHING METHOD***

Frontal lectures with slides (30 hours) and workshop (20 hours).

***ASSESSMENT METHOD AND CRITERIA***

Oral examination. During the examination an example of authentic assessment will be discussed; it will concern a teaching process for nursery or primary school on one of the topics discussed during the course (chosen by students). La discussione del compito autentico riguarderà in particolare un’analisi critica sul metodo utilizzato all’interno del percorso didattico (con particolare riferimento all’utilizzo del metodo induttivo, alla verticalità del percorso, al ruolo del maestro mediatore e all'elaborazione delle modellizzazioni dei bambini). Assessment will also be based on accuracy of content discussed and quality of presentation. Following the discussion of the authentic assessment, students must be able to answer open-ended questions on course topics not directly connected to the topic explored in the authentic assessment.

Sound critical discussion about the authentic assessment during the examination is crucial for obtaining a 30/30 mark.

In view of the assessment of basic theoretical knowledge during the oral examination (crucial for passing the examination, regardless of marks awarded for the authentic assessment) critical discussion of the authentic assessment and answers to the open-ended questions will carry the same weight towards determining the final result.

The assessment criteria adopted for the final exam will include accuracy of answers, use of appropriate terminology, ability to use argumentation coherently, and ability to identify conceptual connections and open issues. The final mark will result from the students’ ability to meet these criteria.

Only the students who regularly attend the workshop and successfully pass the final test will be admitted to the final exam.

***NOTES AND PREREQUISITES***

Previous knowledge of chemistry is not an essential prerequisite for students.

However, an open and possibilistic approach is expected to encourage the emergence or strengthening of interest and curiosity for the discipline and for the methodological approach.

Further information can be found on the lecturer's webpage at http://docenti.unicatt.it/web/searchByName.do?language=ENG or on the Faculty notice board.