

COURSE INFORMATION

EUPeace Alliance University	Calabria
Course Title	Didactics of Chemistry for Natural Science Teachers (Upper Secondary) Didattica della Chimica per Docenti di Scienze Naturali A050
Department and/or Faculty	Department of Biology, Ecology and Earth Sciences (DiBEST)
Course Code	A050
Course Type	Course Modality
<input type="checkbox"/> Curricular <input checked="" type="checkbox"/> Non-curricular	<input checked="" type="checkbox"/> Online <input checked="" type="checkbox"/> Synchronous <input type="checkbox"/> Asynchronous <input type="checkbox"/> Both (A/S)ynchronous
	<input type="checkbox"/> In-person <input type="checkbox"/> Lecture <input type="checkbox"/> Laboratory
Date	Summer semester (March-June)
Language(s) of Instruction	Italian
Course Coordinator	Elvira Brunelli, elvira.brunelli@unical.it ; and +39 0984 492996
Course Instructor	Marta Erminia Alberto, marta.alberto@unical.it and +390984/492105

TARGET AUDIENCE

Suitable as Pre-Service Teacher Training Course

Pre-primary Primary Secondary Lower Secondary Upper Tertiary

Suitable as In-Service Professional Development Course

Pre-primary Primary Secondary Lower Secondary Upper Tertiary

Suitable for non-student body

Administrative staff Other

TYPE – WORKLOAD – RECOGNITION

Number of hours	12 hours
<input checked="" type="checkbox"/> ECTS Credits	2
<input type="checkbox"/> Certificate	None

COURSE DESCRIPTION (EN/L1 [if taught in L1])

Content

- Fighting chemophobia through the construction of better learning environments in school;
 - False “Chemistry Myths” and biased risk perceptions;
 - Natural vs Chemical, how to deal with fake-news;
 - Teaching Tips to enhance students’ appreciation of and interest in Chemistry;
 - Main tools, methodologies and strategies to make teaching chemistry more enjoyable and manageable;
 - The 5E approach (Engage, Explore, Explain, Elaborate, and Evaluate);
 - Overview and critical analysis of the chemistry curriculum within the National Italian National Curriculum for upper secondary schools;
 - Didactic choices for building fundamental chemistry concepts such as atomic structure, chemical bonding, thermodynamics, kinetics.
 - How to design and implement interdisciplinary and transversal courses for upper secondary chemistry education (The fantastic world of metals; Chemistry of the atmosphere; Drug development: Inspiring success stories; Light and health)
-
- Contrastare la “chemiofobia” attraverso la costruzione di migliori ambienti di apprendimento;
 - Falsi miti sulla chimica e percezioni di rischio distorte;
 - Naturale vs Chimico, come proteggerci dalle fake-news;
 - Suggerimenti Didattici per aumentare l’interesse verso la chimica;
 - Principali tools, softwares e strategie per favorire l’insegnamento della chimica;
 - L’approccio 5E (Engage, Explore, Explain, Elaborate, and Evaluate);

- Rassegna critica dei contenuti di Chimica presenti nelle linee guida ministeriali relative all'insegnamento delle Scienze Naturali nella scuola secondaria superiore;
- Scelte didattiche per affrontare al meglio alcuni dei concetti basilari della chimica;

Percorsi interdisciplinari da proporre a scuola (Il fantastico mondo dei metalli; La chimica dell'atmosfera; La scoperta di alcuni farmaci: storie di successo; Luce e salute)

Competences & Learning Objectives

Students will be able to:

- Understand how to design and implement learning environments that, by providing a structured approach to teaching chemistry, explicitly address the all-too-common negative biases and feelings that society has towards chemistry.
- Know how to effectively blend theoretical knowledge with conscious didactic choices, proper teaching methodologies, technology Integration, hands-on experimentation, problem-solving exercises, active learning strategies and real-world analysis and applications.
- Understand how to apply the 5E approach so to optimize teaching-tools, software, methodologies and strategies so to make teaching chemistry more enjoyable.
- Be able to critically analyse the current chemistry contents included in national upper secondary curricula and elaborate proper didactic choices to develop fundamental and often abstract chemistry concepts which students generally find difficult to grasp, such as atomic structure, chemical bonding, thermodynamic and kinetics.
- Course participants will be able to develop less conventional and more interdisciplinary contents which show students how "being chemistry literate" underlies everyday events and decisions, such as light and health, and food and health, how climate policies affect the air we breathe, etc.

Alla fine del corso, gli studenti saranno in grado di:

- Proporre la costruzione di un ambiente di apprendimento che, per mezzo di un approccio didattico strutturato, consenta di contrastare la crescente percezione negativa della Chimica nella società (chemiofobia);
- Saper combinare efficacemente solide basi teoriche a scelte didattiche consapevoli, metodologie di insegnamento adeguate, integrazione tecnologica, sperimentazione pratica, esercizi di problem solving, strategie di apprendimento attivo e analisi e del mondo reale e applicazioni.
- Saper applicare l'approccio 5E, giuste metodologie e strategie che includano anche l'uso di specifici tools e softwares per favorire l'apprendimento e renderlo più fruibile;
- Essere in grado di analizzare con spirito critico i contenuti di chimica inclusi nelle attuali linee guida ministeriali relative all'insegnamento delle Scienze Naturali nella scuola secondaria superiore, al fine di praticare scelte didattiche ponderate ed efficaci per garantire l'apprendimento di nuclei fondamentali della chimica, talvolta ostici per gli studenti, come la struttura atomica, il legame chimico, la termodinamica e la cinetica.

Gli studenti saranno in grado di sviluppare percorsi interdisciplinari meno convenzionali e più attuali

LINK to Course Details

https://www.unical.it/didattica/offerta-formativa/formazione-insegnanti/60cfu/30cfu_art19/

¹ **University:** Please make sure that all courses offered by your University have the same naming system where these "names" appear, consistent with the EUPeace site: Philips Marburg; Justus-Liebig Giessen; Calabria; Comillas; Cukurova; Limoges; Mostar; Sarajevo; West Bohemia

² **Code:** For courses already catalogued within your Institutional Course Catalogue, please use the Institutional course code; if the course is not yet available, state „Pending“. For courses which are offered via this EUPeace Course Catalogue but which are not within the Institutional Course Catalogue, please insert "EUPeace".

³ **Type – Workload – Recognition:** “Curricular” refer to courses already within the Institutional Course Catalogue, with associated ECTS credits and which conclude in a “Degree”; “Non- curricular” refer to courses which may not appear within your Institutional Course Catalogue, are probably not associated with ECTS credits, probably do not conclude in a “Degree”, but do provide participants “documentation and recognition” (e.g. certificate, diploma, etc.). To indicate, check (double click and select) the one which applies.

⁴ **Modality:** Check off all relevant boxes. Therefore, if a course can be offered both Online and In-Person, this will be apparent. To indicate, check (double click and select) the one which applies.

⁵ **Audience:** Approximate ages: Pre-primary (age 0-5); Primary (6-10); Lower Secondary (11- 13); Upper Secondary (14-18). “Pre-service Tertiary” (e.g. PhD students); “In-Service Tertiary” (e.g. University Faculty). To indicate, check (double click and select) the one which applies.

⁶ **Content & Competences & Learning Objectives:** Please first provide text in EN. Then, if course is taught through L1, please insert L1 text below the EN text.