General competences

|  |
| --- |
| **Bachelor** |
| ***Physics*** | ***Chemical Engineering*** | ***Physics and Chemistry Teachers*** |
| Ability to communicate effectively in writing and orally in first and one foreign language | Ability to communicate effectively in writing and orally in first and one foreign language | Ability to communicate effectively in writing and orally in first and one foreign language |
| Ability for abstract thinking, analysis and synthesis, and to develop argumentation with critical mind. | Ability for abstract thinking, analysis and synthesis, and to develop argumentation with critical mind. | Ability for abstract thinking, analysis and synthesis, and to develop argumentation with critical mind. |
| Ability to identify, select, analyse and summarize various specialized resources to document a subject | Ability to identify, select, analyse and summarize various specialized resources to document a subject | Ability to identify, select, analyse and summarize various specialized resources to document a subject |
| Ability to use digital tools of reference and rules of computer security to acquire, process, produce and disseminate information as well as to collaborate internally and externally | Ability to use digital tools of reference and rules of computer security to acquire, process, produce and disseminate information as well as to collaborate internally and externally | Ability to use digital tools of reference and rules of computer security to acquire, process, produce and disseminate information as well as to collaborate internally and externally |
| Ability to plan and organise one’s own activities, self-learning and skills enhancement | Ability to plan and organise one’s own activities, self-learning and skills enhancement | Ability to plan and organise one’s own activities, self-learning and skills enhancement |
| Ability to act with social and environmental responsibility, civic awareness and ethical reasoning | Ability to act with social and environmental responsibility, civic awareness and ethical reasoning | Ability to act with social and environmental responsibility, civic awareness and ethical reasoning |
| Able to step back from a situation, self-evaluate and questioning himself in order to improve knowledge and skills | Able to step back from a situation, self-evaluate and questioning himself in order to improve knowledge and skills | Able to step back from a situation, self-evaluate and questioning himself in order to improve knowledge and skills |
| Ability to establish their role and mission within an organization, to adapt and take initiatives. | Ability to establish their role and mission within an organization, to adapt and take initiatives. | Ability to appreciate and take into account the diversity and multiculturality of school pupils and students |
| Ability to work as part of a team while being independent and responsible with respect to a project | Ability to work as part of a team while being independent and responsible with respect to a project | Ability to engage in an individual and collective approach to professional development |

|  |
| --- |
| **Master** |
| Ability to work in a team, in an interdisciplinary and international environment | Ability to work in a team, in an interdisciplinary and international environment | Ability to influence people and / or groups, anticipate the future and contribute the personal and professional development |
| Ability to address and respond well to situations in a new and original ways within the given context | Ability to address and respond well to situations in a new and original ways within the given context | Ability to address and respond well to situations in a new and original ways within the given context |
| Ability to identify, analyse and define the significant elements constituting a problem in order to solve it effectively and with good criteria | Ability to identify, analyse and define the significant elements constituting a problem in order to solve it effectively and with good criteria | Ability to identify, analyse and define the significant elements constituting a problem in order to solve it effectively and with good criteria |
| Ability to do fundamental and applied research and apply its results independently for solving tasks in new or unfamiliar environment, implement innovations  | Ability to do fundamental and applied research and apply its results independently for solving tasks in new or unfamiliar environment, implement innovations  | Ability to do fundamental and applied research and apply its results independently for solving tasks in new or unfamiliar environment, implement innovations  |

Professionnal competencies : Ability to…

|  |
| --- |
| **Bachelor** |
| ***Physics*** | ***Chemical Engineering*** | ***Physics and Chemistry Teachers*** |
| Mobilize fundamental concepts concepts in order to simulate, analyze and solve simple physics problems. | Mobilize appropriate concepts and methods in the fields of mathematics, physics, chemistry and computer science to address and solve problems in chemical engineering. | Mobilize appropriate concepts and methods in the fields of mathematics, physics, chemistry and computer science to address simple problems and experiments in Physics and chemistry |
| Identify and lead independently the different steps of an experimental approach using common devices and techniques in the different fields of physics. | Identify and lead independently the different stages of an experimental approach in physics, chemistry and chemical engineering | Applied disciplinary knowledge and their didactics with the most appropriate method  |
| Analyze and exploit experimental data, taking into account sources of errors and uncertainty and probe a model by comparing its predictions to the experimental results  | Analyze and exploit experimental data, taking into account sources of errors and uncertainty and probe a model by comparing its predictions to the experimental results | Design and implement practical teaching to develop interest in natural sciences, understanding their methods and identifying their fields of application |
| Use a programming language and analysis software with a critical mind to collect andexploit data | Use a programming language and analysis software with a critical mind to collect andexploit data | Build, implement and animate effective teaching and learning situations, taking into account the diversity of students |
| Use the main mathematical tools relevant for physics. | Apply, control, manage and design chemical processes by using information and computer technologies; | Organize and ensure a group operating mode that promotes student learning and socialization ensuring learner's progress, assessment of achievements and feedback |
| Apply concepts and experimental methods of physics in the fields of civil engineering, fluid and solid mechanics and mechanical engineering, thermodynamics and heat, materials physics, chemical sciences, geosciences, astronomy. | Apply, manage, design, launch and repair technological processes by using information and computer technologies; | Ensuring learner's progress, assessment of achievements and feedback |
| Identify specific regulations and implement the main prevention measures in terms of health, safety and environmental responsability | Identify specific regulations and implement the main prevention measures in terms of health, safety and environmental responsability | analyze individualy and collectively its practices for professional development |
| **Master** |
| Document in an exhaustive and synthetic way an emerging research subject in his field of competencesIdentify, analyze and assimilate the main concepts of the new research theme | Document in an exhaustive and synthetic way an emerging method, devices or system in his field of competencesIdentify, analyze and assimilate the main concepts of a whole production process | Document in an exhaustive and synthetic way an educational research subject in his field of competencesIdentify, analyze and transfer main concepts of a research theme in a new and useful problematic |
| Build, plan and implement a starting research project | Build, plan and implement a production process project | Build, write and plan a starting research project concerning the field of education in physics and chemistry |
| Design and implement an experimental and/or theoretical approach on a research problematic of its disciplinary field, using autonomously experimental methods and adapted scientific equipments. | Design and implement autonomously a new chemical engineering process using state of the art methods and equipments. | Implement autonomously a new educational sciences research problematic in the field of physics and chemistry teaching |
| Formatting and presenting research results according to international standards of the field for oral presentation and publication in A level scientific reviews | Formatting and presenting technology and engineering report | Contribute to the production of new materials or educational materials from recent results of educational research |
| Integrate and contribute autonomously to a collaborative research project | Integrate and contribute autonomously to a collaborative engineering project | Integrate and contribute autonomously to new collaborative pedagogical approachs like program approach and/or competences based approach |