 **Qualifications Reference Framework (Meta-Profile) of General Descriptors of a Bachelor Programme in the Subject Area of PHYSICS (LEVEL 6)**

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| QF EHEA  1st cycle descriptors | SQF domain dimensions  Level 6  (BACHELOR) | EQF descriptor Knowledge  Level 6  *Advanced knowledge of a field of work or study, involving a critical understanding of theories and principles* | EQF descriptor Skills  Level 6  *Advanced skills, demonstrating mastery and innovation, required to solve complex and unpredictable problems in a specialised field of work or study* | EQF descriptor Autonomy and Responsibility (Wider Competences)  Level 6  *- Manage complex technical or professional activities or projects, taking responsibility for decision-making in unpredictable work or study contexts*  *- Take responsibility for managing professional development of individuals and groups* |
| I. *Have demonstrated knowledge and understanding in a field of study that builds upon their general secondary education, and is typically at a level that, whilst supported by advanced textbooks, includes some aspects that will be informed by knowledge of the forefront of their field of study* | **1.Theories and models** | Describe the fundamental concepts, laws, models and theories of classical physics and elements of modern physics, as well as their application across a number of real-life situations. | Use physical concepts, laws and theories from various domains of physics to model, analyse and explain simple physical phenomena and problems. | Identify relevant physics theories and models required to interpret phenomena, observations, and real-life situations. |
| II. *Can apply their knowledge and understanding in a manner that indicates a professional approach to their work or vocation, and have competences typically demonstrated through devising and sustaining arguments and solving problems within their field of study* | **2. Mathematical methods** | Name and describe standard mathematical (analytical and numerical) tools and methods and their application in the context of physics theories. | Apply standard mathematical (analytical and numerical) tools and methods to solve problems in physics. | Identify and employ standard mathematical (analytical and numerical) tools and methods to solve problems and model situations. |
| **3. Experimental design and scientific investigation** | Describe standard methods, instrumentation, techniques, theories and regulations used in experimental physics. | Design a simple experimental investigation, using standard instrumentation and follow guidelines, and apply basic methods, techniques and theories for data collection, analysis and reporting. | Set up and carry out simple scientific investigations safely under supervision. |
| **4. Problem solving** | Link physics concepts and laws with basic strategies, procedures, tools and criteria for framing, representing, solving and validating the results of a problem. | Categorise problems based on physical principles, analyse a problem, recognise its structure and devise a (creative) plan for its solution, execute the devised plan and check for its validity. | Address problems from the point of view of physics, identifying the laws and concepts that apply in a specific situation, devise and carry out a (creative) plan for reaching a solution and check its validity. |
| III. *Have the ability to gather and interpret relevant data (usually within their field of study) to inform judgements that include reflection on relevant social, scientific or ethical issues* | **5. Scientific culture** | Describe the main traits of the historical and epistemological development of physics and relate them to changes and/or issues in technology, society, and the rules of the scientific community. | Select with guidance and use sources of information on the history and current development of physics and on epistemology, and analyse some relevant examples also in relation to technological and societal issues. | Identify some common ideas and approaches in different areas of science also in relation to its historical and epistemological evolution, and evaluate the influence of science on technology and society in some relevant cases. |
| **6. Work ethic and integrity** | State general ethical principles, norms, values, and standards relevant to the work of a physicist, as well as some examples when physics influences health, environment, politics and/or society. | Apply general ethical rules and rules of scientific conduct to the assigned tasks. | Make decisions in line with ethical norms and with regard to civic responsibility, and contribute to local communities and organisations according to own competence. |
| IV. *Can communicate information, ideas, problems and solutions to both specialist and non-specialist audiences* | **7. Communication** | Describe different methods and tools of communication. | Present complex information in a concise manner orally and in writing. | Evaluate scientific material, communicate it orally and in writing in language appropriate for the audience. |
| **8. Project Management and Teamwork** | Describe strategies for project work and demonstrate attitude to work collaboratively. | Organize and complete a simple project individually or in team. | Identify and implement an appropriate strategy to carry out a simple individual or group project, collaborate constructively, exercise some initiative and acknowledge accountability for the assigned tasks. |
| V. *Have developed those learning skills that are necessary for them to continue to undertake further study with a high degree of autonomy* | **9. Professional development** | Identify relevant competences needed for pursuing further studies (career goals), as well as personal strengths, weaknesses and attitudes. | Organise own study and/or learning process, using different kinds of learning materials; evaluate personal work and search for information and support. | Enter new fields of study through a positive attitude, evaluate own personal and professional competences and take responsibility for own learning. |