An Erasmus+ Project
PharmTech Mobility: Enhancing European Pharmacy Technician Exchange and Mobility

# A Comparative and EQF-Aligned Framework Report for Pharmacy Technician Education and Practice in Europe

"Education Pathways, Professional Roles, Skills and Mobility across Ireland, Belgium, Spain, and Portugal"

**PHARMTECH MOBILITY**

Enhancing European Pharmacy Technician
Exchange and Mobility

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European Association
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This document is the final version of the PharmTech Mobility Framework developed as part of the Erasmus+ PharmTech Mobility Project (Project Reference: 2024-1-IE01-KA210-VET-000245362). It incorporates feedback received during the public consultation phase.

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## Executive Summary

The *PharmTech Mobility: Enhancing European Pharmacy Technician Exchange and Mobility* project is an Erasmus+ collaborative initiative that responds to a critical challenge facing European healthcare systems: the limited transparency, comparability, and recognition of pharmacy technician education and professional practice across EU Member States. Despite the essential role pharmacy technicians play in supporting the safe and effective use of medicines, significant variation persists in education pathways, scopes of practice, regulatory status, and professional recognition, creating barriers to workforce mobility and mutual understanding.

This report presents a structured comparative analysis of pharmacy technician education, roles and responsibilities, and professional and transferable skills across four participating countries: Ireland, Belgium, Spain, and Portugal. Its primary objective is to develop a shared reference framework that supports mobility, recognition, and collaboration, while fully respecting national autonomy and regulatory diversity.

Chapter 1 examines pharmacy technician education systems through the lens of the European Qualifications Framework (EQF). The analysis demonstrates that, while qualification structures and delivery models vary, substantial convergence exists in core curricular domains, including pharmacy practice, pharmaceutical science, pharmacology, chemistry, microbiology, and applied biological sciences. Education pathways typically span EQF Levels 4 to 6, reflecting progressive development from foundational vocational competence to advanced, degree-level preparation. Across all countries, supervised work placement emerges as a critical component of education, supporting the integration of theoretical knowledge with professional practice. The framework proposed in this report aligns these learning outcomes across EQF levels, enhancing transparency and comparability without prescribing uniform curricula.

Chapter 2 explores pharmacy technician roles and responsibilities in both community and hospital settings. The findings highlight a clear relationship between education level, regulatory context, and scope of practice. While entry-level roles commonly focus on dispensing support, stock management, and patient-facing services, advanced roles increasingly encompass aseptic preparation, medicines management, quality assurance (QA), and operational leadership. The analysis reveals that, in settings where pharmacy technicians are educated to higher EQF levels and supported by clear regulatory frameworks, they contribute more extensively and autonomously to healthcare delivery. This chapter underscores the importance of aligning

education, regulation, and workforce planning to ensure safe delegation, optimal skill utilisation, and improved service efficiency.

Chapter 3 focuses on professional and transferable skills, recognising their central importance to contemporary pharmacy practice. Communication, teamwork, ethical awareness, digital competence, adaptability, and reflective practice are identified as essential attributes across all participating countries. These skills underpin patient safety, interdisciplinary collaboration, and resilience within rapidly evolving healthcare systems. The report emphasises lifelong learning as a defining characteristic of the profession, supporting continued competence and responsiveness to technological, organisational, and societal change.

Collectively, the findings of this report demonstrate that pharmacy technician education and practice across Europe share a strong common foundation, despite national differences. Building on this convergence, the PharmTech Mobility project proposes a non-regulatory, EQF-aligned reference framework designed to support mutual understanding, qualification transparency, and mobility. The framework is intended for use by educators, policymakers, professional bodies, and employers as a tool for dialogue, curriculum development, and strategic workforce planning.

This report does not seek to standardise national systems. Rather, it affirms the value of diversity within a shared European context and provides a structured basis for cooperation, mobility initiatives, and future development. By enhancing the visibility and recognition of pharmacy technician competences, the PharmTech Mobility project contributes to workforce sustainability, patient-centred care, and the long-term resilience of European healthcare systems.

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*Author Contributions*

This report was developed collaboratively by the PharmTech Mobility Project Consortium. All authors contributed to the development of the report, including research, data collection, writing, editing, and review. Contributions also included national context analysis, curriculum mapping, and the examination of professional roles and skills within participating countries. Tao Zhang coordinated the overall project design and implementation and led the integration of the comparative framework and final editorial synthesis. All authors reviewed and approved the final report.

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## Acknowledgements

**Preface**

The *PharmTech Mobility: Enhancing European Pharmacy Technician Exchange and Mobility* project, hereafter referred to as PharmTech Mobility, was established under the Erasmus+ programme, KA210-VET – Small-scale Partnerships in Vocational Education and Training (KA210-VET). The project reference is 2024-1-IE01-KA210-VET-000245362.

This initiative brings together partners from Ireland, Belgium, Spain, and Portugal to address a longstanding challenge: the lack of a harmonised educational and professional framework for pharmacy technicians across the European Union (EU). Pharmacy technicians are vital members of the healthcare workforce. They ensure the safe preparation, dispensing, and management of medicines, supporting pharmacists and wider healthcare teams in both community and hospital settings.

Across Europe, however, the education, regulation, and scope of practice of pharmacy technicians vary considerably. In some countries, such as Portugal, Spain, and Belgium, pharmacy technicians are regulated professionals with clearly defined responsibilities and recognised qualifications. In others, such as Ireland [1], the role is less formally regulated, with education and practice standards differing in duration, scope, and depth.

This diversity creates challenges for workforce mobility and mutual recognition of qualifications. It also limits opportunities for pharmacy technicians to fully contribute to European healthcare systems, at a time when the demand for highly skilled healthcare professionals continues to grow due to demographic changes, evolving health service needs, and increasingly complex pharmaceutical care.

The motivation for PharmTech Mobility stems from this lack of coherence. Educational pathways for pharmacy technicians range from vocational training at secondary level to higher education awards, and their roles differ significantly. In some contexts, technicians may engage in aseptic compounding, ward-based medicines optimisation, and advanced patient-facing services. In others, their responsibilities may focus primarily on dispensing and inventory management. Against this backdrop, the PharmTech Mobility project was developed to:

- Map and compare existing pharmacy technician education and training structures in the four participating countries, identifying areas of convergence and divergence.

- Develop a shared educational framework structured by the European Qualifications Framework (EQF), defining knowledge, skills, and competences across different levels.

- Define roles and responsibilities of pharmacy technicians in both community and hospital contexts, including emerging and advanced practice roles.

- Identify professional and transferable skills such as communication, digital literacy, teamwork, and adaptability that support employability and career progression.

- Facilitate mobility and recognition by promoting transparency in qualifications and supporting mutual recognition of competences across the EU.

This report represents a key output of the project and is structured into three main chapters:

- Chapter 1 presents a comparative curriculum framework, organised by EQF levels, covering scientific foundations, pharmacy practice, professional development, and applied skills. It also incorporates Work Placement as a core component, highlighting its essential role in providing supervised, hands-on experience in real-world healthcare settings.

- Chapter 2 describes the roles and responsibilities of pharmacy technicians, showing how expectations evolve from entry-level tasks to more advanced professional functions.

- Chapter 3 defines the professional and transferable skills that enable pharmacy technicians to succeed in diverse and dynamic healthcare environments.

The framework proposed in this report does not aim to impose uniformity. National systems and regulations will continue to reflect local healthcare models, traditions, and labour market needs. Instead, this framework serves as a shared reference point to encourage alignment, dialogue, and progressive harmonisation across borders.

By combining insights from higher education institutions, vocational training centres, and professional associations, this report supports a vision of a more coherent and mobile European pharmacy technician workforce. The ultimate beneficiaries are pharmacy technicians themselves - professionals whose knowledge, skills, and dedication play a crucial role in improving patient care and public health across Europe.

For more information, please visit www.pharmtechmobility.com.

For general enquiries, feedback, or collaboration opportunities, contact the project team at info@pharmtechmobility.com.

**Table of Contents**

**Abbreviation List**

| | |
|---|---|
| AAS | Atomic absorption spectroscopy |
| ADRs | Adverse drug reactions |
| AHDMP | Acute Hospitals Drugs Management Programme |
| AUC | Area under a curve |
| BMI | Body mass index |
| CAM | Complementary and alternative medicines |
| CE | Circular economy |
| CERT | Chemistry Education Research Team |
| CNS | Central nervous system |
| CPR | Cardiopulmonary resuscitation |
| DDI | Drug–drug interaction |
| DIT | Dublin Institute of Technology |
| DNA | Deoxyribonucleic acid |
| EAN | European Academic Network |
| EAPT | European Association of Pharmacy Technicians |
| ECG | Electrocardiogram |
| ECTS | European Credit Transfer and Accumulation System |
| EMA | European Medicines Agency |
| EQF | European Qualifications Framework |
| ES | Emission spectroscopy |
| ESG | Environmental, social, and governance |
| EU | European Union |
| GMP | Good Manufacturing Practice |
| GLP | Good Laboratory Practice |
| GPCR | G protein-coupled receptors |
| HCAI | Health Care Associated Infections |
| Hours | Hrs |
| HPLC | High performance liquid chromatography |
| ICH | International Council for Harmonisation of Technical Requirements for Pharmaceuticals for Human Use |
| ICHEC | Irish Centre for High End Computing |
| IMPs | Investigational medicinal products |
| INCI | International Nomenclature Cosmetic Ingredient |
| IPU | Irish Pharmacy Union |
| IR | Infrared spectroscopy |
| IT | Information Technology |
| IUPAC | International Union of Pure and Applied Chemistry |

| | |
|---|---|
| LE | Linear economy |
| MS | Mass spectrometry |
| NA | Not Applicable |
| NAIRTL | National Academy for the integration of Research, Teaching and Learning |
| NatPro | Trinity Centre for Natural Products Research |
| NMR | Nuclear magnetic resonance spectroscopy |
| NQF | National Qualification Framework |
| NVQ | National Vocational Qualification (UK) |
| OSCE | Objective Structured Clinical Examination |
| OTC | Over-the-counter |
| O/W | Oil-in-water |
| PCRS | Primary Care Reimbursement Service |
| PPE | Personal protective equipment |
| QA | Quality assurance |
| RCSI | Royal College of Surgeons in Ireland |
| RDAs | Recommended daily allowances |
| RSC | Royal Society of Chemistry |
| SOPs | Standard operating procedures |
| SDGs | Sustainable Development Goals |
| TCD | Trinity College Dublin |
| TLC | Thin layer chromatography |
| TPN | Total parenteral nutrition |
| TU | Technological University |
| UPLC | Ultra performance liquid chromatography |
| UV-Vis | Ultraviolet–visible spectroscopy |
| VET | Vocational education and training |
| WHO | World Health Organisation |
| W/O | Water-in-oil |

**The PharmTech Mobility Consortium**

The *PharmTech Mobility: Enhancing European Pharmacy Technician Exchange and Mobility* project was funded under the Erasmus+ programme, KA210-VET – Small-scale Partnerships in Vocational Education and Training. The project has brought together three core partners from Ireland, Belgium, and Spain, with additional collaboration from Portugal, to co-develop a common framework for pharmacy technician education across Europe.

This section introduces the consortium members and their distinctive contributions. It highlights how each organisation's expertise, higher education, vocational training, and professional advocacy, has been critical to the success of the project. Together, the partners represent a unique intersection of perspectives, ensuring that the outcomes of PharmTech Mobility are both academically rigorous and practically relevant.

**Technological University Dublin (Ireland) – Coordinating Institution**

Technological University Dublin (TU Dublin) [2] is Ireland's first technological university and one of its largest providers of higher education, with over 28,000 students and a strong emphasis on practice-based learning, research, and innovation. Within the Faculty of Sciences and Health at TU Dublin, the School of Food Science and Environmental Health [3] has led the delivery of pharmacy technician education since 2006.

The Pharmacy Technician Studies programme [4] at TU Dublin is delivered at Level 6 of the National Qualification Framework (NQF) [5] and is recognised for its excellence in curriculum design, student-centred learning, and strong engagement with industry and healthcare employers. The programme has received *the DELTA (Disciplinary Excellence in Learning, Teaching and Assessment) Awards* [6] three times (2025-2028, 2021-2024 and 2018–2021) from the National Forum for the Enhancement of Teaching and Learning in Higher Education, recognising sustained innovation in teaching. It has also been honoured with the *AHECS (The*

*Association of Higher Education Careers Services) Employability Award for Research-Informed Practice (2023)* [7].

TU Dublin's role in PharmTech Mobility has been to coordinate the project, ensuring that timelines, outputs, and quality standards are met. It has provided leadership in curriculum design, comparative analysis, and integration of professional skills into the framework. TU Dublin also brings extensive experience in supporting student mobility and in embedding research outcomes into teaching, thereby enriching the project's academic depth.

*Project members*: Dr Tao Zhang (Project Coordinator), Dr Seána Hogan, Prof Christine O'Connor and Dr Gemma Kinsella.

**Tao Zhang**

Dr Tao Zhang is a Lecturer and Principal Investigator (PI) at the School of Food Science and Environmental Health, TU Dublin (Grangegorman), formerly Dublin Institute of Technology (DIT). He graduated with a First-Class Honours BSc (Hons) in Pharmaceutical Technology from DIT in 2004, receiving the AGB Award for Excellence. He subsequently obtained a Postgraduate Diploma in Quality Improvement from Trinity College Dublin (TCD) in 2006, followed by a PhD in Pharmacy Research from the School of Pharmacy and Pharmaceutical Sciences, TCD, in 2009. After completing postdoctoral research at TCD, Dr Zhang transitioned to the pharmaceutical industry, joining Trino Therapeutics Ltd in 2011 as a Senior Chemist and later serving as Principal Scientist. He played a key role in drug discovery programmes and led GMP manufacturing campaigns, successfully advancing PH46A to European human clinical trials. In 2017, he joined APC Ltd as a Team Lead, managing a multidisciplinary team focused on the development and optimisation of (bio)pharmaceutical processes. Dr Zhang returned to academia in 2018 as a Lecturer at TU Dublin, where he currently serves as Programme Chair for the nationally and internationally recognised Pharmacy Technician Studies programmes (TU654|TU657). He is also Co-Coordinator of the European Academic Network (EAN) under the European Association of Pharmacy Technicians (EAPT), and a Principal Investigator at the Trinity Centre for Natural Products Research (NatPro). His research interests lie in drug discovery, natural product science, and ethnopharmacology, with a particular focus on identifying bioactive compounds from natural sources and applying synthetic approaches to address health challenges and unmet clinical needs. In parallel, his research in higher education explores curriculum design and professional development, particularly within pharmacy and pharmaceutical education. Dr Zhang is currently the Project Lead of the Erasmus+ KA2

initiative PharmTech Mobility: Enhancing European Pharmacy Technician Exchange and Mobility.

**Seána Hogan**

Dr Seána Hogan qualified as a pharmacist in 2007 with a Member of The Pharmaceutical Society of Ireland (PSI) [8] and Degree in Pharmacy from Royal College of Surgeons in Ireland (RCSI). Since 2006 she has work as a Lecturer in Pharmacy Practice, Pharmacology and Therapeutics and the Work Placement Coordinator for the Higher Certificate in Science in Pharmacy Technician Studies at TU Dublin, previously DIT. Alongside her academic role, she is an Educational Editor at the Irish Pharmacy Union (IPU) [9] Professional Academy, contributing to the development of high-quality continuing professional development resources for pharmacists and pharmacy technicians. She also continues to practice as a Pharmacist with Boots Retail Ireland in their branch in Dún Laoghaire, ensuring her teaching and editorial work remain grounded in up-to-date professional practice. At TU Dublin, Dr Hogan has been central to the growth and innovation of the Pharmacy Technician Studies programme. She has coordinated student work placements, developed innovative assessment practices, promoted peer-led learning models. Her teaching emphasises applied knowledge, professional skills, and student partnership. Dr Hogan is currently supporting the Erasmus initiative on PharmTech Mobility: Enhancing European Pharmacy Technician Exchange and Mobility

**Christine O'Connor**

Prof Christine O'Connor completed her PhD with Prof Han Vos in Dublin City University in 1999. On completion of her PhD Christine managed an analytical EU CRAFT project titled 'Experimental validation of a novel multipurpose distillation technology' in DIT with Dr John Fox. From 2000 to 2004 she became an Assistant Lecturer in the School of Chemical and Pharmaceutical Sciences, DIT. Prof O'Connor was a Lecturer in the School of Chemical and Pharmaceutical Sciences from 2004-2014. Prof O'Connor was appointed Assistant Head of School of Food Science and Environmental Health, DIT in 2014. She received an Honorary Professorship from DIT in 2018. She is a Fellow of the Royal Society of Chemistry (RSC) since 2020. Prof O'Connor is an active researcher in the areas of inorganic/ bioinorganic chemistry, waste valorisation and bioactive analysis, and trace chemical analysis in food

products. She has also a depth of experience in curriculum design and has been working with developing countries on research projects and course design at undergraduate and postgraduate third level Universities. Prof O'Connor is the Treasurer of the RSC Educational Committee of Ireland and Chair of the RSC Ireland Steering Group. Prof O'Connor is a member of the Royal Irish Academy Physical, Chemical and Mathematical Sciences Committee.

**Gemma Kinsella**

Dr Gemma Kinsella received a first-class honours B.A. Mod in 'Computational Chemistry' as well as her PhD from the Department of Chemistry in TCD and subsequently was a postdoctoral fellow in the Molecular Design Group in the Department of Biochemistry, TCD. She worked with the Irish Centre for High End Computing (ICHEC) and IBM before completing an IRCSET and a HRB postdoctoral fellowship in the Membrane Protein Lab, of the Department of Biology, NUIM. She completed a Postgraduate Diploma in Higher Education, in Maynooth University in 2014. She has lectured in the School of Food Science and Environmental Health in TU Dublin since 2015 and acted as programme chair of the Pharmacy Technician programme. She became Assistant Head of School in 2022. Dr Kinsella's Research interests include on: (i) Protein structure prediction (GPCRs and other targets) and the early stages of drug development for diseases encompassing Type II Diabetes and cancer; (ii) Green chemistry biocatalysis is another focus area - utilisation of computational protein engineering to design thermo and solvent tolerant enzymes with industrial applications.

**European Association of Pharmacy Technicians (Belgium/Portugal)**

The European Association of Pharmacy Technicians (EAPT) [10], established in 2010, is the leading pan-European body representing the interests of pharmacy technicians. Based in Belgium, it provides a platform for networking, advocacy, and knowledge exchange among technicians, educators, regulators, and policymakers. EAPT's mission is to enhance the recognition of pharmacy technicians as healthcare professionals, to harmonise education and practice standards, and to strengthen their role within European health systems.

Within PharmTech Mobility, EAPT has contributed a comparative European perspective, ensuring that the framework reflects trends across multiple member states, not only the three main institutional partners. Its expertise in analysing education and professional practice across borders has been invaluable in identifying common competencies and articulating transferable

skills. Moreover, EAPT's network has enabled the project to disseminate findings widely and to embed the voice of practitioners in the development process.

*Project members*: Dr Cristiano Matos, Dr João Joaquim, Dr Angelo Miguel Cardoso Jesus and Carolina Valeiro.

## Cristiano Matos

Dr Cristiano Matos is a pharmacy technician, researcher, and educator with a strong academic background and over a decade of professional experience. He holds a Bachelor's in Pharmacy (2011) and a Master's in Applied Pharmacotherapy (2014) from Coimbra Health School, a PhD in Pharmacy from the University of Seville (2020), a Postgraduate Diploma in Herbal Medicines from the University of Coimbra (2020), and a Master's in Medical Statistics from the University of Aveiro (2022). He has lectured at Coimbra Health School since 2018, focusing on Pharmacoepidemiology, Pharmacovigilance, Toxicology, Pharmacotherapy and Phytotherapy. Dr Matos currently serves as President of both the European Association of Pharmacy Technicians and the Portuguese Association of Pharmacy Technicians. Dr Matos is actively involved in two Erasmus+ KA2 projects: PharmTech Mobility: Enhancing European Pharmacy Technician Exchange and Mobility and Introducing Pharmacy Technicians as Immunizers through E-Learning.

## João José Joaquim

Dr João José Joaquim is a pharmacy technician and has served as a full-time professor and researcher at the Coimbra Health School (Escola Superior de Tecnologia da Saúde de Coimbra) since 2001. He holds a Bachelor's (Hons) degree in Pharmacy (2000) from Coimbra Health School, a Master's degree in Toxicology (2007) from the University of Aveiro, and a PhD in Pharmacy and Health (2023) from the University of Salamanca. Additionally, he completed postgraduate studies in Pharmacoepidemiology (2001) at the University of Lisbon and in Genetic Toxicology and Toxicogenomics (2006) at the New University of Lisbon. Dr Joaquim is certified as a Clinical Investigator (Levels 1 and 2) by Nova Medical School and UNAVE – University of Aveiro (2022), and holds the Global Pharmacovigilance Professional Certificate (2025), awarded by the Institute of Pharmacovigilance on behalf of the International Society of Pharmacovigilance (ISoP). His academic and research interests focus on drug toxicology,

pharmacovigilance, and pharmacoepidemiology. He has extensive experience in curriculum development, academic leadership, and student supervision. Dr Joaquim served as President of the Coimbra Health School from 2017 to 2021. He is also a former President of the Portuguese Association of Pharmacy Technicians (2001–2023) and EAPT (2011–2017), where he promoted professional development and cross-border collaboration in pharmacy education and practice. Dr Joaquim is currently engaged in two Erasmus+ KA2 projects: (1). PharmTech Mobility: Enhancing European Pharmacy Technician Exchange and Mobility; (2). Introducing Pharmacy Technicians as Immunizers through E-Learning. In addition, he is an active researcher in the RePo-SUDOE project, funded by the INTERREG SUDOE Programme, focusing on drug repurposing in Southern Europe.

## Ângelo Jesus

Dr Ângelo Jesus is a pharmacy technician with professional experience in Community and Hospital Pharmacy. Holds a Bachelor Degree (2007) from the School of Health of Porto Polytechnic. Dr Jesus started to collaborate in the teaching of future Pharmacy Technicians in 2009 and this eventually led him to his PhD in Educational Sciences- Educational Technology - (Emphasys in Pharmacy Teaching and Learning). He has since been Course Director and has been involved in the accreditation process, and also in the new curricular plan of the BSc Pharm. He holds several postgraduate certification from Portuguese and Spanish universities both in Radiopharmacy and Pharmaceutical Care. Currently, Dr Jesus is a collaborating researcher at LAQV/REQUIMTE Research Centre and has authored several publications in Portuguese and English regarding Pharmacy Practice and Pharmacy Education. He is Member of the Pedagogical Council since 2016 and former member and trainer at the e-Learning and Pedagogical Innovation Unit from Porto Polytechnic Institute.

## Carolina Valeiro

Carolina Valeiro is a pharmacy technician with experience in Community Pharmacy and Medical Sales. She graduated from the Coimbra Health School in 2021 and holds a Master's degree in Pharmacovigilance and Pharmacoepidemiology (2024) from the European Programme in Pharmacovigilance and Pharmacoepidemiology (Eu2P). Currently, Carolina is pursuing a PhD in Pharmacy at the University of Seville, focusing on areas related to Pharmacovigilance and Public Health. Carolina is actively involved in international research and education through her role as a Research Assistant at the European Association of Pharmacy Technicians (EAPT). Her work includes participation in two Erasmus+ KA2 projects:

(1). PharmTech Mobility, which promotes the exchange and mobility of Pharmacy Technicians across Europe; (2). Introducing Pharmacy Technicians as Immunizers through E-Learning, aimed at expanding the professional role of technicians in public health.

## Fundación Dales la Palabra / Tres Olivos Technical School (Spain)

The Fundación Dales la Palabra, through its Tres Olivos Technical School [11] in Madrid, is recognised as a national leader in inclusive education and vocational training. The foundation was originally established to provide high-quality education for students with hearing impairments, and today it delivers a range of mainstream and vocational programmes, including Pharmacy Technician Studies (Técnico en Farmacia y Parafarmacia) [12].

The Tres Olivos Technical School has more than 15 years of experience in pharmacy technician education and maintains strong collaborations with over 100 community pharmacies and healthcare institutions in Madrid and beyond. Since 2015, it has been deeply engaged in Erasmus+ projects, securing the VET Mobility Charter in 2018 and achieving Erasmus+ VET Accreditation (2021–2027). These credentials underline its commitment to internationalisation, inclusivity, and mobility.

In PharmTech Mobility, Fundación Dales la Palabra has brought the perspective of VET, ensuring that the framework is grounded in practice and accessible to learners from diverse backgrounds. Its expertise in inclusive pedagogy has also ensured that accessibility and equity remain central to the project's design.

*Project members*: Isabel Elguero Claramunt, M Jesús Aparicio Cabezas; Antonio Rodrigo Díaz; Alejandra Reyes Moreno

## Isabel Elguero Claramunt

Isabel Elguero Claramunt studied Veterinary Medicine at the Complutense University of Madrid. After several years working in the field, during which she published articles on the brown bear population in Poland, she returned to Spain and completed a Master's Degree in Education, qualifying her to teach in the health branch of vocational training. Since 2011, she has been a teacher in the Intermediate Vocational Training Programme for Pharmacy and

Parapharmacy Technician. Isabel also manages the centre's visibility and social media presence, promoting its activities and fostering community engagement. Since 2015, she has coordinated Erasmus+ projects, enabling students to participate in mobility programs for educational internships across Europe. She has participated in various job shadowing experiences in training centers in Serbia and Slovenia. With a curious and innovative mindset, Isabel continues to develop professionally through training in digitalisation, project-based learning, active methodologies, and inclusion.

## María Jesús Aparicio Cabezas

María Jesús Aparicio Cabezas holds a degree in Pharmacy from the University of Alcalá de Henares. After gaining experience in community pharmacy, María Jesús worked in the quality sector, implementing regulatory standards in pharmacy practice. She has taught in various educational institutions and, since 2012, has been a teacher in the Intermediate Vocational Training Programme for Pharmacy and Parapharmacy, where she also supervises most of the internships for second-year students. Her deep knowledge of the pharmaceutical sector enriches the school's curriculum through her innovative proposals and strong professional network. In addition, María Jesús manages the centre's website and virtual classroom, ensuring smooth communication and access to educational resources for students and staff. A passionate traveller and committed educator, she brings valuable expertise and energy to the centre's educational project.

## Alejandra Reyes Moreno

Alejandra Reyes Moreno is originally from the Canary Islands, where she built her professional career in the banking and business sectors, acquiring solid experience in finance, administration, and customer service. She is currently a teacher at the centre, where she teaches key subjects such as employability, occupational risk prevention, entrepreneurship, and professional development. She manages student internships and co-organises the school's annual Employment Week. Since joining the European Projects Department, she has taken a leading role in coordinating Erasmus+ mobilities to Portugal and supports the administrative side of the program. Alejandra stands out for her organisational skills, proactive attitude, and her strong commitment to preparing students for real-world professional environments.

## Antonio Rodrigo Díaz

Antonio Rodrigo Díaz is the VET stage coordinator and a key figure in the smooth running of the department. Antonio's background in youth associations and summer camps led him to become one of the first teachers at the centre when it opened in 2001. With extensive teaching experience, he eventually joined the leadership team as VET coordinator. Under his guidance, the department has grown both in student numbers and in its educational offering. He has played a key role in establishing partnerships with companies and external organisations, strengthening the centre's network for internships, projects, and collaborations. He was also the driving force behind the creation of a virtual classroom platform, where all teaching materials developed by the staff are made accessible to enrolled students. Open to new opportunities, Antonio actively seeks international collaborations. An energetic and sports-minded professional, he supports decision-making across the project and plays an active role in the European Projects Department.

**Chapter 1. Comparative Educational Curricula for Pharmacy Technicians**

Education forms the foundation of pharmacy technician competence, shaping both professional practice and opportunities for cross-border mobility. Across Europe, pharmacy technician education reflects a diversity of qualification frameworks, programme durations, and pedagogical approaches. Programmes range from secondary-level vocational training to higher education degrees, with variations in the balance between scientific, practical, and professional domains.

Table 1 provides a comparative overview of representative pharmacy technician programmes in Portugal, Ireland, Spain, and Belgium, focusing on course structure, delivery, qualification level, and professional preparation. While national standards share the common goal of producing competent pharmacy support professionals, the scope and academic level of training vary - from vocationally oriented EQF Level 4 programmes to higher education degrees at EQF Level 6. This high-level comparison offers an important foundation for understanding national contexts and for informing future harmonisation and mobility efforts under the PharmTech Mobility initiative.

The Spanish MECU Level 4A is approximately comparable to EQF Level 4. However, Spain's VET education system is not formally referenced to EQF levels (Clasificación Internacional Normalizada de la Educación: CINE-P-3.5.4) [13]. This equivalence is therefore approximate and intended only as a guideline for comparison.

European Credit Transfer and Accumulation System (ECTS) credits primarily apply to higher-education programmes (EQF Level ≥5), while vocational qualifications are typically expressed in terms of training hours. Programme duration and structure can vary between institutions within each country; the examples presented in the table represent typical national pathways.

In Ireland, pharmacy technician qualifications are delivered mainly through technological university–based programmes, with an additional academy-based education model provided through the Irish Pharmacy Union (IPU) [14] Professional Academy. These pathways reflect distinct accreditation, governance, and training structures. In the technological university context, pharmacy technician programmes are delivered by academic staff appointed in accordance with third-level education requirements. This typically includes holding postgraduate qualifications at MSc and/or PhD level, recognised teaching credentials, and demonstrable expertise in relevant fields such as pharmacy practice, pharmaceutical sciences, microbiology.

In contrast, within the IPU Professional Academy pathway, assessors and tutors are required to be registered pharmacists, members of the Pharmaceutical Society of Ireland (PSI), and actively working in a pharmacy setting. They generally work part-time as employees of the IPU and must complete the following training:

1. City & Guilds Level 3 Understanding the Principles and Practices of Assessment

2. City & Guilds Level 3 Assess Occupational Competence in the Work Environment

3. IPU Assessor Training, including dedicated assessor support

*Table 1. Comparative Overview of Pharmacy Technician Education Programmes in Portugal, Ireland, Spain, and Belgium*

| | Spain | Belgium | Ireland | Ireland | Ireland | Portugal |
|---|---|---|---|---|---|---|
| **Course Title** | Técnico en Farmacia y Parafarmacia | Assistant pharmaceutico-technique | IPU Pharmacy Technician | Pharmacy Technician (Studies) | Pharmacy Technician (Studies) | Licenciatura em Farmácia |
| **NQF** <br> **EQF** | MECU Level 4A <br> Approx. EQF 4 | EQF 4 <br> (EQF 5)* | NQF 5 <br> EQF 4 | NQF 6 <br> EQF 5 | NQF 7 <br> EQF 6 | - <br> EQF 6 |
| **Delivery Mode** | Online or onsite | Onsite | Workplace based | Onsite | Onsite | Onsite |
| **Course Duration** | 2000 hours (2 years) | 1 year <br> (2 years)* | 2 years | 2 years | 1 year (add-on) | 4 years |
| **Course Option** | Full time | Full-time | Full time | Full time | Full time | Full-time; part-time |
| **Course Focus** | Primarily community pharmacy; some include hospital pharmacy | Community pharmacy (community or hospital)* | Community pharmacy | Community & hospital pharmacy | Applied pharmacy (community and hospital) | Comprehensive coverage of community, hospital, and others |
| **Teaching Weeks per Academic Year** | 32-44 | 34 <br> (38)* | 48 | 24 | 30 | 30 |
| **Course Entry Requirements** | ESO (Secondary Education) diploma; basic VET graduates (ISCED 353); or age 17+ via recognition of prior learning (formal, informal, or non-formal). | Min. 18 years, completed compulsory education, sufficient proficiency in the language of instruction | Junior Certificate pass in Science subject or third-level diploma in a science field, plus 1 year community pharmacy experience. | Leaving Certificate (Maths, English/Irish, Science subject recommended) | NQF Level 6 or equivalent | One of the following sets: 02 Biology and Geology or 02 Biology and Geology + 07 Physics and Chemistry or 02 Biology and Geology + 16 Mathematics |

| | | | | | | |
|---|---|---|---|---|---|---|
| **Total ECTs (if applicable)** | N/A | N/A (90)* | N/A | 120 | 120 | 240 |
| **Work Placement** | Please refer to Work Placement Section 1.4 | | | | | |
| **Highlighted Employability Skills** | While specific emphases vary across countries and institutions, common employability skills include communication, teamwork, ethical practice, work-based learning, critical thinking, and problem-solving. | | | | | |
| **Teacher/Lecturer Requirement** | Public institutions: Public service exams. Private or publicly funded institutions: Relevant qualifications and experience assessed by interview. All: Master's degree in Teacher Training required. | Relevant professional degree or diploma in the field; demonstrable professional experience; Teacher training certificate (EQF 4) | Assessors and tutors must be registered pharmacists (MPSI) with City & Guilds Level 3 Assessment Qualifications and IPU Assessor Training. | MSc or PhD in discipline area | MSc or PhD in discipline area | PhD or Academic Specialist in Pharmacy (>10 years' experience) |
| **Statutory Regulation** | Yes | Yes | No | No | No | Yes |
| **Qualification to Practice as Pharmacy Technician** | Técnico en Farmacia y Parafarmacia qualification | Diplôme d'assistant pharmaceutico-technique | IPU Certificate (NVQ3- UK BTEC accreditation via Pearson International) | NQF Level 6 Higher Certificate awarded by a Technological University | BSc degree for upskilling | Licenciatura em Farmácia + Professional title issued by Central Administration of the Health System |

* *From September 2028 in Flanders, Belgium, the Pharmacy Technician qualification will change from a 1-year to a 2-year programme (90 ECTS, 38 teaching weeks per academic year), with a general first year followed by a choice of Community Pharmacy or Hospital Pharmacy in the second year. The qualification will be recognised as EQF Level 5, and a teacher training certificate will not be required at this level.*

*NA: Not formally aligned or referenced to ECTS. NQF: National Qualification Framework. EQF: European Qualification Framework.*

Chapter 1 therefore presents a Comparative Educational Curriculum Framework designed to bridge these variations and support greater alignment and mutual recognition across systems. The framework is structured around the European Qualifications Framework (EQF), enabling transparent mapping of knowledge, skills, and competences across qualification levels. It recognises that learning outcomes develop progressively, with each EQF level building upon the previous one. Accordingly, each level description in this chapter includes elements that are common to that level and to the levels above it.

- **EQF Level 4 and above** – Foundational vocational education programmes, typically of two years' duration, emphasising practical competences and essential pharmacy knowledge. Common features are observed across programmes at EQF Levels 4, 5, and 6 (e.g., Belgium, Spain, Ireland and Portugal).

- **EQF Level 5 and above** – Programmes situated in higher education, with an increased emphasis on applied scientific knowledge, problem-solving, and critical thinking. Shared characteristics are evident across EQF Levels 5 and 6 (e.g., Ireland and Portugal).

- **EQF Level 6 –** bachelor's degree-level education preparing graduates for expanded scope of practice, leadership responsibilities, and potential progression to advanced or specialised roles (e.g., Portugal and Ireland).

The curriculum is organised by disciplinary domains, such as fundamental sciences, pharmaceutical sciences, pharmacy practice, health promotion, business management, and sustainability. It also incorporates transversal domains like professional development and occupational health and safety.

A critical component of the curriculum is Work Placement. Integrated into formal learning rather than treated as a standalone element, work placements allow students to apply their skills in real-world settings such as community and hospital pharmacies, industry, regulatory bodies, and other healthcare organisations. This experiential learning consolidates theoretical knowledge, develops professional behaviours, and prepares graduates for seamless transition into the workforce.

This framework provides educators, regulators, and employers with a structured reference point for aligning pharmacy technician education across diverse systems. It highlights areas of convergence while respecting national differences, supporting mobility, mutual recognition of qualifications, and continuous improvement in training quality.

## 1.1    EQF Level 4 and Above – Shared Across Spain, Belgium, Ireland and Portugal

At this Level (EQF 4 and above), common to Spain, Belgium, Ireland, and Portugal, the aim and syllabus of each training discipline focus on establishing foundational scientific knowledge and skills, technical competences, and professional behaviours required for safe and effective pharmacy practice. Core areas include pharmacy practice, pharmaceutical calculations, compounding, stock management, and health literacy, complemented by fundamental sciences such as biology, chemistry, and pharmacology. Supporting subjects such as mathematics, business administration, sustainability, and professional development provide learners with the transferable skills necessary for workplace readiness. These programmes are often two years in duration and are characterised by a strong emphasis on practical learning and workplace application.

While most training is delivered through classroom-based or blended vocational education, some countries, such as Ireland, also offer work-based learning models in which students gain their qualification entirely through supervised practice in the workplace. This approach demonstrates an alternative but equally valuable pathway for acquiring competence and is presented later in this section as a case example.

Table 2 below summarises the curriculum domains identified within the framework (comprising 13 disciplinary areas) and the learning outcomes common to pharmacy technician programmes across the four participating countries at EQF Levels 4, 5, and 6. It illustrates the shared foundations and progressive development that characterise pharmacy technician education in Europe.

*Table 2. 13 Disciplinary Areas in Pharmacy Technician Training/Education: Overview, Learning Outcomes, and Indicative Syllabi (Common to EQF Levels 4 - 6)*

| 1.1.1 | Pharmacy Practice |
|---|---|
| **Overview** | This component introduces the structure and layout of pharmacy practice in the country, and its role within the national healthcare system. It includes an overview of the legislative framework governing pharmacy, legal classifications of medicines, national guidelines, and the role of pharmacy regulators.<br><br>Learners will develop counselling and communication skills, with particular emphasis on conditions commonly presenting at the over-the-counter (OTC) counter and the medicines used to treat them. The importance of recognising warning signs and conditions which need to be referred to the pharmacist will be a core goal.<br><br>Pharmaceutical calculation skills are developed through practical examples from both community and hospital pharmacy contexts. Learners will engage in health promotion activities, educating patients and families on various disease states, and participating in health screening initiatives.<br><br>Further development of OTC knowledge will be achieved through the analysis of complex or high-risk scenarios, especially those involving vulnerable populations such as children, pregnant women, and the elderly.<br><br>The similarities and differences between community and hospital pharmacy practice will be explored, with a detailed examination of the expanding role of pharmacy technicians in both sectors. The differences and similarities between community and hospital pharmacy are teased out as well as covering the current and expanding role of pharmacy technicians in hospital and community. Hospital pharmacy is covered in detail including hospital specific tasks technicians are engaged in including aseptic compounding, ward top ups, satellite clinics. Additional topics include dispensary management, health promotion strategies, complementary and alternative medicines (CAM), ostomy care and compliance aids. This component aims to:<br><br>1. Provide learners with a thorough understanding of the pharmacy sector's structure and its role within the national healthcare system. |

2. Develop learners' understanding of the role of the pharmacy regulator and the importance of adhering to national guidelines.

3. Enable learners to comprehend how medicines are regulated and licensed in the country and the EU, including the role of national regulatory authorities.

4. Enhance learners' communication and patient counselling skills for effective interaction with patients and healthcare professionals.

5. Ensure learners can collect relevant and accurate information for safe product recommendations and can identify conditions requiring pharmacist referral.

6. Equip learners to provide appropriate advice and counselling on a wide range of OTC conditions.

7. Instruct learners in prescription interpretation, dispensing procedures, and the use of pharmacy computer systems.

8. Ensure proficiency in pharmaceutical calculations and numeracy through focused instruction and practice.

9. Develop learners' understanding of health promotion activities and their contribution to improving community health and wellbeing of the local population.

10. Enable learners to instruct, advise and refer patients on a wide range of health matters including lifestyle, smoking cessation, CAM, vitamins, herbal medicines as well as safety in the sun.

11. Develop learners' understanding of the structure of the various strands of pharmacy in the country and the technician's role within them.

12. Build learners' understanding of specialised roles in aseptic and non-aseptic compounding, ward top up services in Hospital Pharmacy.

13. Enable learners to understand the role of Standard Operating Procedures (SOPs) and how they help in minimising risk.

14. Enable learners to comprehend the legislation around interchangeable medicines and reference pricing and know what these mean in practice and how to apply them.

15. Instruct learners in dispensing procedures and practices, pharmacy computer systems and interpreting prescriptions.

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| | ***Depending on the country or the education provider, learners will be able to:*** <br><br> 16. To develop sales techniques and strategies that enhance customer interactions and improve sales performance in the pharmacy. <br><br> 17. To apply principles of visual merchandising and marketing to create effective product displays and promotional campaigns that drive customer engagement. <br><br> 18. To optimise the pharmacy's product range and layout, tailoring the environment to meet customer needs and encourage repeat business. <br><br> 19. To learn about the composition, safety, and application of dermocosmetic products. <br><br> 20. To evaluate and recommend dermocosmetics according to skin condition and needs. |
| **Learning Outcomes** | *Upon successful completion of this component, learners will be able to:* <br><br> 1. Explain the Pharmacy Law, the Country's Statute Book (if applicable), the role of the pharmacy regulator and the European Medicines Agency (EMA) as well as the various classifications of medicines in the country. <br><br> 2. Explain the role of the country's pharmacy regulator and how to interrupt and adhere to guidelines issued by them. <br><br> 3. Demonstrate the ability to recognise and council on common illnesses and discuss these using correct basic medical terminology. <br><br> 4. Demonstrate the ability to appropriately use techniques [e.g., WWHAM (Ireland)/ PASITAMAE (Spain)] to answer a patient query at the OTC counter recommending a suitable treatment with necessary advice or recognise situations which should be referred to the pharmacist. <br><br> 5. Demonstrate the ability to follow dispensing procedures and practices and be able to interpret prescriptions and prepare medicines for dispensing. <br><br> 6. Review the various healthcare schemes in operation in the country. <br><br> 7. Demonstrate the ability to maintain patient medical records and generate medicine labels using standard pharmacy computer systems. <br><br> 8. Communication Skills development. |

9.  Research Skills of Relevant Literature Developed.

10. Demonstrate the ability to correctly perform various pharmaceutical calculations relevant to both community and hospital pharmacy.

11. Explain the use of less common OTC drugs.

12. Demonstrate ability to appropriately counsel patients on a range of healthcare issues.

13. Analyse the contemporary role of the pharmacy technician.

14. Using appropriate software accurately dispense prescriptions including correct product selection, accurate production of a label, suitable counselling advice to the patient including explaining what medication is for, how to take it, what side effects or interactions to be aware of and answer any queries the patient may have.

15. Understand and be able to demonstrate the role of pharmacy in health promotion activities.

16. Be able to perform various health screening activities including taking blood pressure, body mass index (BMI) calculations, diet and lifestyle advice, smoking cessation advice.

17. Describe the role differences between technicians working in hospital, industry and community.

18. Identify accurately the correct scheme under which a particular prescription should be dispensed.

19. Explain the use of SOPs in practice and their benefits.

20. Describe the use of compliance aids in pharmacy including supply to residential settings.

21. Understand the needs and products available for the care of ostomy patients.

22. Deal with customers' complaints recognising and applying performance criteria and procedures.

23. Understand the evaluation criteria for determining skin type.

***Depending on the country or the specific pharmacy setting, learners will be able to:***

24. Organise OTC and front-of-shop products at the point of sale using appropriate merchandising techniques.

25. Demonstrate knowledge of the classification, composition, and use of cosmetic and nutricosmetic products.

26. Select suitable dermo-pharmaceutical products for the care and protection of the skin and its appendages.

| Indicative Syllabus (Theory) | <ul><li>Contemporary role of the pharmacy technician within healthcare framework.</li><li>Medical terminology.</li><li>Recognition of common illnesses.</li><li>Distinction between minor illness and major disease.</li><li>Referral of therapeutic problems to the pharmacist.</li><li>Common conditions that present at the OTC counter and drugs used to treat them and patient counselling.</li><li>Legislation relating to pharmacy, to include Medicinal Products, Misuse of drugs act and regulations.</li><li>Poisons Legislation, Animal Remedies Legislation, Family Planning Legislation and Methylated Spirits Legislation. Legal classification of medicines in the country and the country's Statute Book.</li><li>Dispensary theory, procedures, and protocols.</li><li>Verification and submission of prescriptions for payment from government schemes.</li><li>Pharmacy IT system solutions.</li><li>Maintaining patient medical records.</li><li>Structure of a prescription.</li><li>Pharmaceutical abbreviations.</li><li>Apply scientific notation.</li><li>Perform calculations involving unit conversions relating to dosage, frequency, quantity, total volume required, mg/kg doses, etc.</li><li>Medicine labelling, record keeping, packaging, and containers.</li><li>Appropriate and inappropriate ethical and professional behaviour.</li><li>Identifying patient needs through Listening, Questioning, Explaining, Sensitivity and Confidentiality.</li><li>CAM: aromatherapy, Bach flower remedies, herbal and homeopathic products.</li></ul> |
|---|---|

|  | <ul><li>Nutritional support and supplements: vitamins, minerals, amino acids, dietary supplements and dietary advice for healthy living.</li><li>Health promotion and public health: counselling on asthma inhaler use (including use of placebo inhalers); guidance on administration of eye/ear drops, etc. Family planning and sexual health. Pregnancy testing and nutrition support. Psychological support for patient. Drug addiction awareness. Safe and effective use of medications.</li><li>Less common OTC products and effective patient counselling. Domiciliary services. Drug misuse. Ostomy care. Safety in the sun. Smoking cessation. Surgical dressings. Elastic hosiery.</li><li>Role-play situations constantly focusing on communication skills. Handling complaints and claims.</li><li>Sales protocols (including up-selling and linked selling techniques) for OTC and front of shop products.</li><li>Organisation and visual merchandising of OTC and front of shop products. Planning and executing sales campaigns. Digital marketing.</li><li>Dermocosmetics and Skin Care: skin types; skin routines; cosmetic products; cosmetic Ingredients; understanding the International Nomenclature Cosmetic Ingredient (INCI) *(may vary depending on the country or pharmacy setting)*.</li><li>Hospital pharmacy: stand-alone series of hospital pharmacy lectures to distinguish hospital pharmacy technicians' roles for community pharmacy. In depth look at various hospital pharmacy activities including ward top ups, non-aseptic and aseptic compounding, TPN, cytotoxics, medicines information, dispensing medicines to outpatients.</li><li>Business of pharmacy: Purchasing; stock control; wages; customer accounts; pharmacy business administration and procurement; dispensary management and accounting; legislation dealing with interchangeable medicines and reference pricing and what this means for pharmacy in the country.</li><li>Pharmacy technician: new roles, including accredited-checking technician, ward-based technician, etc. Role of professional organisations. Codes of Practice. SOPs and their use in practice.</li><li>Falsified medicines: Basic understanding of identifying, preventing, and reporting falsified medicines, including awareness of the EU/national regulatory framework and relevant legislation.</li></ul> |
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| Indicative Syllabus (Laboratory) | • Set up pharmacy with OTC products and prescription medication. |
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| | • Presentations on product groups, including indications, contraindications, and dosage etc. |
| | • Role plays on different scenarios - different illnesses different types of people - children, elderly, special needs. |
| | • Different symptoms-warning symptoms. Supervisor plays the part of the customer. |
| | • Introduce a questioning structure to ascertain whether to recommend an appropriate product or refer to Pharmacist. |
| | • The method of questioning a patient or customer to gather suitable information for treatment or referral is used at the OTC counter. ("What are the symptoms?", "How long have they had the symptoms?", Action already taken to treat symptoms, Medicines being taken for other medical conditions). |
| | • Legal requirements of a prescription. |
| | • Legal requirements of a label and pricing accurate labels. |
| | • Classroom analysis or video to study peers to discuss whether correct course of action was followed. |
| | • Mock prescriptions some with missing legal requirements. Learners to annotate to make them legal. |
| | • Learners have prescriptions that they must complete exercises on, ranging from annotating missing legal requirements to producing labels, dispensing the product, and recording necessary information. Could follow this up with some basic counselling for certain types of common prescription medicines e.g., antibiotics. |
| | • Presentations on product groups including indications, contraindications and dosage etc. |
| | • Mock prescriptions on more complicated drugs/ controlled drugs. This would involve record-keeping. |
| | • More role plays on less common illnesses or ones with more 'care' needed, and therefore more advanced communication skills needed, e.g. medicines for thrush/cystitis, etc. Prescribed drug use in practice. Diagnostic testing. Inhaler techniques, Blood glucose testing. Blood pressure measuring. Cholesterol testing. |
| | • Advanced pharmaceutical calculations. |
| | • Individualised drug dosing system preparation. |

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| | • Organisation and display of OTC/front of shop products. Sales campaigns and visual merchandising. Digital marketing. |
| | • Skin analysis. Skin routine and recommendations **(*May vary depending on the country or pharmacy setting*)**. |
| **1.1.2        Mathematics** *(This component is included in some national or institutional programmes, depending on local requirements)* | |
| **Overview** | This component is considered a non-common, standalone training subject across the partner countries at EQF Level 4. In most cases, mathematical content is integrated into other subjects rather than taught as a separate module. Learners at this level are expected to demonstrate foundational mathematical skills relevant to pharmacy technician practice, including the use of basic scientific notation, standard unit conversions, and simple calculations required in dosage preparation and pharmaceutical measurements. |
| **Learning Outcomes** | *Upon completion, learners will be able to:* <br><br> 1. Manipulate simple formulae by isolating a variable. <br><br> 2. Simplify algebraic expressions by applying the appropriate operational properties and the correct order of operations. <br><br> 3. Factorise algebraic expressions in elementary but non-trivial cases. <br><br> 4. Apply the laws of exponents, including the power of a product, quotient, and power of a power. <br><br> 5. Use a calculator to: <br>     o determine an approximate value of the positive square root of a positive number. <br>     o determine the numerical value of a mathematical expression. <br>     o determine the trigonometric values of an angle with an amplitude less than 90°. <br><br> 6. Solve linear equations or inequalities with one variable and numerical coefficients. <br><br> 7. Read and interpret graphs of affine (linear) functions. <br><br> ***Note: The above specific learning outcomes may vary depending on the country and the educational provider.*** |

| Indicative Syllabus (Theory) | N/A |
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| Indicative Syllabus (Laboratory) | N/A |

| 1.1.3 Pharmaceutical Technology and Formulation | |
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| Overview | This component provides learners with an overview of pharmaceutical dosage forms. It focuses in detail on formulation of drugs and excipients; drug properties, function and selection; compounding specific quality tests and standards for individual product classes; pharmacopoeias and other information sources.<br><br>The component aims to provide learners with an overview of the range of pharmaceutical dosage forms available. To introduce learners to the technological and scientific principles underlying the design and manufacture of pharmaceutical preparations. To give learners a comprehensive knowledge of, and practical training in, the formulation, manufacture and testing of medicinal products according to both pharmacopeial and non-pharmacopeial methods. To provide learners with a knowledge of applicable quality standards and testing methods. To heighten learners' awareness of stability/compatibility issues and their management in the formulation, manufacture and packaging of medicinal products. |
| Learning Outcomes | *Upon successful completion, learners will be able to:*<br>1. Describe the various potential drug delivery routes and indicate their advantages and disadvantages.<br>2. Discuss common information sources relating to medicinal products.<br>3. List and discuss the formulation, manufacture and testing of medicinal products.<br>4. Apply theoretical principles and demonstrate good laboratory practice in the extemporaneous preparation, packaging and labelling of such products.<br>5. Extemporaneously prepare, package and label a medicinal product.<br>6. Counsel patients appropriately on practical issues that arise from the use of specific dosage forms. |

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| | 7. Confidently carryout pharmaceutical calculations that would be required for extemporaneous medicinal product preparation.<br><br>8. Accurately label an extemporaneously prepared medicinal product.<br><br>9. Outline common stability/compatibility problems and methods for their resolution. |
| **Indicative Syllabus (Theory)** | • Bioavailability and pharmacokinetics.<br><br>• Details of the formulation of the following dosage forms', the rationale behind their selection and composition, and information on their manufacture and testing, with emphasis on quality, safety and efficacy:<br><br>   o Solutions (including specific solution types such as linctuses), suspensions and emulsions.<br><br>   o Solids: powders, granules, tablets (including lozenges, buccal tablets and sub-lingual tablets), hard and soft capsules, medicated chewing gums as well as modified release solid.<br><br>   o Semi-solids: Gels, ointments, creams, pastes.<br><br>   o Transdermal semisolids and patches.<br><br>   o Ear drops, ear sprays.<br><br>   o Nasal drops, intranasal solutions/suspensions, nasal sprays, nasal washes.<br><br>   o Eye drops, eye lotions, semi-solid eye preparations.<br><br>   o Injections and injection routes, infusions, concentrates for injection/infusion, powders for injection/infusion, implants.<br><br>   o Suppositories, enemas, pessaries (moulded), vaginal tablets.<br><br>• Expression of concentration for infusion solutions - moles, equivalents, osmoles, calculation of concentrated electrolyte solutions (high alert medication).<br><br>• Information sources: familiarise learners with key reference sources and demonstrate their use. |
| **Indicative Syllabus (Laboratory)** | • Introduction to pharmaceutical compounding, dosage forms, personal protective equipment (PPE), and lab safety. |

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|  | <ul><li>Preparation of oral and topical solutions; solvents, preservatives, and solubility principles.</li><li>Formulation and preparation of oral suspensions; stability and uniformity techniques.</li><li>Preparation of oil-in-water (O/W) and water-in-oil (W/O) emulsions; emulsifying agents and stability.</li><li>Formulation of medicated creams and ointments; heating and mixing methods.</li><li>Quality control testing; pharmacopeial standards for uniformity, solubility, dissolution, and dispersibility.</li><li>Preparation of aqueous and alcoholic gels; selection and use of gelling agents.</li><li>Preparation and evaluation of high-solid-content pastes; spread-ability and stability assessment.</li><li>Preparation and moulding of suppositories; selection of appropriate bases.</li><li>Sterile preparation of non-parenteral eye drops; isotonicity, pH adjustment, and filtration techniques.</li><li>Integrated dispensing practical; combining multiple formulation techniques with labelling and patient. Counselling.</li><li>Cost evaluation of a compounded formulation.</li></ul> |
| **1.1.4**      **Fundamental Biological Sciences** | |
| *1.1.4.1*   *Physiology* | |
| **Overview** | This component aims to develop an overview of the structure (anatomy), functions (physiology) and pathologies related to the human being. |
| **Learning Outcomes** | *Upon successful completion, learners will be able to:*<br>1. Describe human physiological systems and their functions.<br>2. Integrate the concepts of structure and function at biological levels of organisation.<br>3. Describe protein synthesis and the genetic code. |

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| | *At the current EQF level, Pathology is not included as a standalone component in the common curriculum. However, selected pathology-related topics may be integrated within other components, such as Physiology. The extent of this coverage may vary depending on the country or education provider. As a result, learners may be exposed to pathology content to differing degrees, and may be able to:*<br><br>4.  Describe common pathologies related to major human organ system, including the central nervous, musculoskeletal, cardiovascular, urinary, reproductive, digestive, endocrine, and respiratory systems.<br><br>5.  Identify and explain key signs and symptoms of frequently encountered conditions, relating them to the relevant organ systems.<br><br>6.  Link clinical presentations to appropriate diagnostic tests and therapeutic approaches, demonstrating an introductory understanding of patient care pathways. |
| **Indicative Syllabus (Theory)** | • Basic structure and functions of the human physiological systems physical relationships.<br><br>• Excretory system.<br><br>• Circulatory system and blood groups.<br><br>• Physiology of digestion and absorption in the gastrointestinal tract.<br><br>• The endocrine system.<br><br>• The skeletal system.<br><br>• Lymphatic system and immunity.<br><br>• Gas-exchange mechanisms.<br><br>• Reproductive system.<br><br>• Enzyme structure and regulation; industrial uses of enzymes.<br><br>• Protein synthesis and the genetic code.<br><br>• Key signs and symptoms of common pathologies in the central nervous system, musculoskeletal, cardiovascular, urinary, reproductive, digestive, endocrine, and respiratory systems. |

| Indicative Syllabus (Laboratory) | Not common to all depending on the country or education provider. |
|---|---|
| **1.1.4.2 Biology** | |
| Overview | This component enables to develop an overall understanding of fundamental concepts in biology from an introduction to basic biomolecules, to their roles in the cell. |
| Learning Outcomes | *Upon successful completion, learners will be able to:*<br>1. Demonstrate an understanding of the fundamental features of living organisms and their structures.<br>2. Explain the diversity of cytological structures and their functional inter-relationships.<br>3. Outline cellular physiological processes, their underlying cytological basis and their contribution to physiology as a whole.<br>4. Explain the inter-relationships between organisation at molecular and cellular levels and how this relates to increasingly complex body plans. |
| Indicative Syllabus (Theory) | • Structure & function of biomolecules (lipids, carbohydrates, proteins, enzymes and nucleic acids).<br>• Mitosis/Meiosis.<br>• Cytology (cell structure, theory, prokaryotes, eukaryotes).<br>• Membrane Structure & movement across membranes.<br>• Basic Classical Genetics.<br>• Cellular Physiology.<br>• Digestion. |
| Indicative Syllabus (Laboratory) | Not common to all depending on the country or education provider, including STEAM Communications Workshop. |

| 1.1.5 | Pharmacology, Toxicology and Therapeutics |
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| **Overview** | This component encompasses the pharmacology, therapeutics and toxicology of a range of substances utilised as modern drugs for health and well-being. Based on the knowledge of Biology & Physiology, emphasise is placed on the drugs used to treat them. The consequences of varying drug dose on biological response shall be explored. There is a particular focus and emphasis on the clinical aspects of various drug classes. Compounds of natural origin are discussed along with synthetic drugs. Pharmacokinetics, or the effects the body has on drugs, will be explored e.g. drug absorption, distribution, metabolism and elimination. <br><br>The concept and importance of pharmacovigilance is also covered. Emphasises the clinical aspects of drug use and their implications for patient counselling. <br><br>**Aims:** <br><br>1. To develop the student's understanding of drug targets in the human body. <br>2. To develop the student's understanding of the principles of drug action, interaction and toxicity. <br>3. To ensure the learners develop a detailed knowledge of the pharmacology of a range of drug classes from a clinical perspective. <br>4. To enable learners to identify the clinical and practical information necessary to maximise patients benefit from drug therapies. |
| **Learning Outcomes** | *Upon successful completion, learners will be able to:* <br><br>1. Explain the processes of drug absorption, distribution, metabolism and elimination. <br>2. Discuss therapeutic drug monitoring and narrow therapeutic index drugs. <br>3. Identify the clinical and practical information necessary to maximise patients' benefit from drug therapy. <br>4. Describe the principles of drug action, interaction and toxicity. <br>5. Discuss the pharmacology of a range of drug classes from a clinical perspective. <br>6. Demonstrate an ethical awareness (rational drug use). <br>7. Demonstrate effective communication skills and teamwork. |

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| **Indicative Syllabus (Theory)** | • Types of drug action and processes targeted by drugs. |
| | • Pharmacodynamics and drug-target interactions. |
| | • Dosage and response. |
| | • Drug absorption (including blood brain barrier), distribution, metabolism (drug-drug interaction) and elimination. |
| | • Pharmacovigilance. |
| | • Adverse drug reactions. |
| | • Therapeutic drug monitoring, narrow therapeutic index. |
| | • Dependence and tolerance. |
| | • Drug abuse and misuse. |
| | • Effects of commonly abused drugs. |
| | • Drug substitution and discontinuation. |
| | • Basic principles of medicine use. |
| | • Factors influencing response. |
| | • Life stages: neonates, children, elderly. |
| | • Ethical considerations. |
| | • Routes of drug administration and pharmaceutical dosage forms. |
| | • Drugs affecting the gastrointestinal, cardiovascular, respiratory, central nervous system (CNS), endocrine, genitourinary, and musculoskeletal systems. |

### 1.1.6 Pathology (Non-Core)

*At the current EQF Level 4, Pathology is not included as a standalone component in the common curriculum. However, selected pathology-related topics may be integrated within other components, such as Physiology (Component 5). The extent of this coverage may vary depending on the country or education provider.*

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|---|---|
| **Overview** | N/A |
| **Learning Outcomes** | N/A |
| **Indicative Syllabus (Theory)** | N/A |
| **Indicative Syllabus (laboratory)** | N/A |

### 1.1.7 Microbiology and Aseptic Techniques

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| **Overview** | This component provides learners with an adequate knowledge on microbiology & aseptic techniques to work in the pharmacy sector. Learners will learn about the nature of the microbial world (focusing on bacteria, viruses, prions and viruses); and parasites, the advantages, disadvantages and applications of the various organisms are discussed. The factors affecting microbial growth and how these can be used to control them are evaluated. Physical and chemical methods are evaluated. The role of microorganisms in disease is also introduced. |
| **Learning Outcomes** | *Upon successful completion, learners will be able to:*<br><br>1. Identify the essential structural and functional characteristics of microorganisms.<br>2. Explain the factors influencing microbial growth and the principles of microbial control.<br>3. Demonstrate aseptic techniques, microscopy, and microbial culturing.<br>4. Understand the roles of antibiotics, antiseptics, disinfectants, and decontaminants.<br>5. Differentiate microorganisms in food, water, air, and human microbiomes. |

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| **Indicative Syllabus (Theory)** | Fundamentals of Microbiology:<br><br>• Introduction to the microbial world.<br><br>• Eukaryotic and prokaryotic cell structure.<br><br>• Morphology and reproduction of bacteria, fungi, and viruses.<br><br>• Effect of environmental and nutritional factors on microbial growth.<br><br>Microbial Control and Public Health:<br><br>• Control of microbial growth: physical and chemical factors.<br><br>• Epidemiology principles: infection reservoirs, transmission modes, and pathogenicity.<br><br>• Introduction to food intoxication and food infection microorganisms.<br><br>• Hygiene and Indicator organisms. |
| **Indicative Syllabus (Laboratory)** | Not common to all depending on the country or education provider. |

| 1.1.8 | Chemistry |
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| **Overview** | At EQF Level 4, the chemistry component introduces learners to the essential scientific knowledge and laboratory practices needed in a pharmacy setting. The focus is on building a general understanding of chemical principles, developing confidence in basic laboratory techniques, and applying simple calculations relevant to pharmaceutical work. This foundational training supports learners in developing the scientific awareness and practical competence required for safe and effective performance in the pharmacy environment and also lays the groundwork for more detailed study in specialised areas of chemistry at higher EQF levels. |
| **Learning Outcomes** | *Upon successful completion, learners will be able to:*<br><br>1. Know the basic concept of the atom and the periodic table. |

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| | 2. Carry the basic numeracy skills of calculating dilutions and molar concentrations. |
| | 3. Handle laboratory equipment confidently and competently. |
| | 4. Be capable of accurately recording results and writing a comprehensive report on work carried out in the laboratory. |
| | ***Depending on the country or the education provider, learners will be able to***: |
| | 5. Understand core chemistry concepts relevant to pharmaceutical practice. |
| | 6. Know the basic concept of bonding. |
| | 7. Identify and balance chemical reactions, including acid-base, redox, and precipitation. |
| | 8. Understand core physics and chemistry concepts relevant to pharmaceutical practice. |
| | 9. Safely conduct basic laboratory experiments, accurately measure substances, and interpret data. |
| | 10. Measure and interpret physical properties such as density, viscosity, boiling and melting points, pH, and colour to identify unknown substances. |
| **Indicative Syllabus (Theory)** | *2.1.3.2    Fundamentals of Inorganic Chemistry*<br><br>• Inorganic formulation.<br><br>• Chemical elements and the periodic table.<br><br>• Types of chemical bonds.<br><br>• Principles of international chemical nomenclature.<br><br>*2.1.3.3    Quantitative Concepts and Measurement*<br><br>• Expression of concentration: methods and calculations.<br><br>• Overview of units and measurement techniques used in chemical and pharmaceutical sciences.<br><br>• Principles of sensitivity, specificity, precision, and accuracy in quantitative and qualitative analyses. |

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| | ***2.1.3.4    Laboratory Materials and Procedures*** <br><br> • Common laboratory materials: types, handling, and applications. <br><br> • Techniques and procedures for cleaning and sterilising laboratory equipment. <br><br> ***The following may vary depending on the country or the education provider.*** <br><br> • Practical laboratory skills: safe handling, measurement techniques, and error analysis. |
| **Indicative Syllabus (Laboratory)** | • Identification and handling of laboratory materials. <br><br> • Preparation and standardisation of solutions. <br><br> • Inorganic nomenclature and formulation. <br><br> • Periodic table and element classification. <br><br> • Acid-base titration (concentration calculation). <br><br> • Sensitivity and specificity in analytical testing. <br><br> • Dilutions. |
| **1.1.9       Business and Administration (Non-Core)** | |
| **Overview** | This component introduces the basic business concepts and gives an outline of the fundamentals of business management. It includes an introduction to the role of accounting in business and basic business management including HR management. It introduces and marketing and financial (this varies depending on the country or education provider) skills needed to ensure good business management and business growth. Relevant digital skills are developed throughout the component with emphasis on applications in the field of pharmacy. By providing the principles, tools and methodologies it aims to develop an appreciation and basic understanding of business. <br><br> **Aims:** |

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| | 1. To ensure the learners are familiar with basic fundamentals of business management and basic concepts in business.<br><br>2. To develop the learners' knowledge of various business performance measures and how they are used to monitor and drive business performance.<br><br>3. To enable the student to fully engage with the various business aspects required to manage a successful business through practical examples and a business project.<br><br>***Depending on the country or the education provider, learners will be able to:***<br><br>4. To ensure the development of digital skills and basic accountancy skills.<br><br>5. To ensure learners are familiar with the foundation in HR management. |
| **Learning Outcomes** | *Upon successful completion, learners will be able to:*<br><br>1. Describe basic business concepts.<br><br>2. Show evidence of accounting literacy.<br><br>3. Explain generic purchasing/procurement; Interrelate stock control and inventory aspects of supply chain management; Explain VAT returns; Describe risk management in a pharmacy context; Discuss the role of HR management in business; Explain the importance of merchandising and marketing; Knowledge of sales, marketing and merchandising techniques; Demonstrate pharmacy and science relevant digital skills. |
| **Indicative Syllabus (Theory)** | • Business operation – including performance measurement systems.<br><br>• Accounting literacy – payroll Medicines management.<br><br>• Generic purchasing/procurement.<br><br>• Stock taking.<br><br>• Vat returns, invoices, credit notes, debit notes.<br><br>• Merchandising/marketing. |

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| | • HR management. |
| | • Maximising pharmacy income. |
| | • Digital skills with applications in pharmacy and science. |
| | • Entrepreneurial skills. |
| **Indicative Syllabus (Laboratory)** | N/A |

### 1.1.10 Professional Development (Non-Core)
*(This component is included in some national or institutional programmes, depending on local requirements)*

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| **Overview** | This component is designed to strengthen the professional and employability skills essential for pharmacy technician roles. Through a range of structured activities and reflective assessments, learners are supported in developing key graduate attributes, including effective communication, teamwork, self-motivation, collaboration, and emotional intelligence. In addition, the component promotes digital literacy and work-based learning competencies, preparing learners to engage confidently and responsibly in dynamic healthcare and pharmacy environments. By integrating both personal and professional growth, this component plays a vital role in supporting learners' readiness for the workplace and ongoing career development. |
| **Learning Outcomes** | *Upon successful completion, learners will be able to:* <br><br> 1. Awareness, development and articulation of programme specific graduate attributes: active team players; motivated self-starters; collaborative workers; emotionally intelligent; Ethical; work based/work related learners. <br><br> 2. Career decision making, graduate destination and job market exploration, networking, personal brand development and communication, and articulation of key strengths. <br><br> 3. Enhanced digital literacy including digital skills and online networking, personal brand development and communication. <br><br> 4. Assimilation of health and safety concepts into a pharmacy context. |

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| | 5. Assimilation of pharmacy practice, pharmacology and formulation. Critical Reflection for professional practice. |
| **Indicative Syllabus (Theory)** | • Graduate attributes awareness.<br><br>• Ethical awareness.<br><br>• Career planning and professional skills training workshops (e.g., Professional CV development, interview skills training through simulation, and composition of motivational letters).<br><br>• Hospital pharmacy and Community pharmacy operation; Hospital pharmacy and community pharmacy operation.<br><br>• Applied health and safety.<br><br>• Pharmacy related integrated case study. |
| **Indicative Syllabus (Laboratory)** | N/A |

### 1.1.11 Occupational Safety and Health Management (Non-Core)

*(This component is included in some national or institutional programmes, depending on local requirements)*

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| **Overview** | This component introduces the student to the overall concept of workplace health and safety management along with laboratory safety. Occupational safety and health management is a requirement of law, and learners are introduced to the many facets of this safety management framework. To develop a good understanding of the overall concept of safety management within the workplace and the laboratory. This will involve the learners being able to demonstrate a good understanding of the legal requirements of the health and safety management laws. This will give the student a good foundation in the area of risk assessment. |
| **Learning Outcomes** | *Upon successful completion, learners will be able to:*<br><br>1. Understand occupational health and safety law relating to risk assessment.<br><br>2. Have a good understanding of and apply the principles of Hazard Identification, Risk Assessment and Risk Control measures. |

|  | 3. Categorise Risks as Physical, Chemical and Biological Hazards leading to the compilation of a Safety Statement.<br><br>4. To critically assess the causes of workplace accidents.<br><br>5. Conduct a basic workplace risk assessment demonstrating a good understanding of workplace hazards.<br><br>***Depending on the country or the education provider, learners will be able to:***<br><br>6. Demonstrates knowledge of and ability to apply basic first aid measures. |
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| **Indicative Syllabus (Theory)** | • Introduction to health and safety legislation.<br><br>• Hazard and risk Definition- hazard identification.<br><br>• Categorisation of hazards primarily as physical, chemical and biological hazards.<br><br>• Risk assessment and risk assessment techniques.<br><br>• Accident causation model.<br><br>• Accident investigation.<br><br>• Accident and incident reporting.<br><br>• Prevention strategies within the workplace.<br><br>• Measuring safety performance.<br><br>• Safety statements.<br><br>• Fundamental first-aid knowledge, including cardiopulmonary resuscitation (CPR), Heimlich manoeuvre (for choking emergencies), bandaging techniques, bleeding and wound management, first aid for burns (***Note: specific content may vary depending on the country or the requirements of individual education providers***). |
| **Indicative Syllabus (Laboratory)** | N/A |

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| **1.1.12 Sustainability (Non-Core)** *This component is included in some national or institutional programmes, depending on local requirements; in some cases, sustainability is embedded throughout all science-based components within the pharmacy technician programme* | |
| **Overview** | This component explores the principles of sustainability and how they can be integrated into pharmacy and pharmaceutical product management. To develop knowledge and basic competencies in the green economy, sustainability, and the environmental impact of activities, as well as the conditions in which ecological transition requirements modify the sector's productive processes. |
| **Learning Outcomes** | *Upon successful completion, learners will be able to:*<br><br>1. Establishes the differences between Linear Economy (LE) and Circular Economy (CE), identifying CE advantages concerning the environment and sustainable development.<br><br>2. Identifies environmental, social, and governance (ESG) aspects related to sustainability, considering the concept of sustainable development and international frameworks contributing to its achievement.<br><br>3. Characterises environmental and social challenges faced by society, describing their impact on people and productive sectors and proposing actions to minimise them.<br><br>4. Establishes the application of sustainability criteria in professional and personal performance, identifying necessary elements.<br><br>5. Proposes responsible products and services based on circular economy principles.<br><br>6. Engages in sustainable activities, minimising environmental impact.<br><br>7. Analyses a sustainability plan for a sector company, identifying stakeholders, key ESG aspects, and justifying actions for their management and measurement. |
| **Indicative Syllabus (Theory)** | • Sustainability in the current environment.<br><br>• Main environmental and social challenges in sustainable development.<br><br>• Sustainable Development Goals (SDGs) in personal and professional performance.<br><br>• Transition to a circular economy. |

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| | • Business sustainability plan. |
| **Indicative Syllabus (Laboratory)** | N/A |

| 1.1.13 | Nutrition and Health (Non-Core) |
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| **Overview** | This component provides a foundational understanding of the relationship between nutrition and human health, integrating scientific knowledge with global dietary recommendations. Learners will explore how balanced nutrition supports well-being, disease prevention, and sustainable development. Learners will learn to recognise risk factors, dietary triggers, and evidence-based nutritional strategies to manage or prevent major food-related health conditions. |
| **Learning Outcomes** | *Upon successful completion, learners will be able to:*<br><br>1. Explain the principles and objectives of food-based dietary guidelines, including the UN-SDGs, WHO guidelines, and the Harvard Healthy Eating Plate.<br><br>2. Describe the basic structure, functions, and food sources of key macronutrients (carbohydrates, proteins, fats) and micronutrients (vitamins and minerals).<br><br>3. Identify common food-related health conditions such as high cholesterol, diabetes, anaemia, lactose intolerance, coeliac disease, food allergies, obesity, and eating disorders.<br><br>4. Analyse the dietary factors contributing to the development and management of these food-related health conditions.<br><br>5. Apply nutritional knowledge and dietary guidelines to make informed food choices that promote health and prevent disease. |
| **Indicative Syllabus (Theory)** | • Food Based Dietary Guidelines (UN-SDGs, WHO guidelines, Harvard Healthy Eating Plate).<br><br>• Basic knowledge of macronutrients and micronutrients (structure, functions, and food sources).<br><br>• Major food-related conditions: cholesterol, diabetes, anaemia, lactose intolerance, coeliac disease, food allergies, obesity, and eating disorders. |

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| **Indicative Syllabus (Laboratory)** | N/A |

### 1.1.14    Case Example – Distance Learning Vocational Pathway in Ireland

In addition to traditional classroom-based pharmacy technician programmes delivered through vocational and higher education providers across the partner countries, Ireland also offers a distinctive work-based learning model for pharmacy technician education through the Irish Pharmacy Union (IPU), which delivers a two-year, distance-learning Pharmacy Technician Course leading to the BTEC Level 3 Diploma in the Principles and Practice for Pharmacy Technicians (EQF Level 4 / UK RQF Level 3). This programme is specifically designed for pharmacy staff in employment, combining self-directed online study with supervised, mentored practice in community pharmacies. It serves learners who gain their qualifications entirely through their workplace rather than attending formal classroom or laboratory instruction. This model is presented separately below in Table 3 to illustrate its unique contribution to the broader spectrum of pharmacy technician education within Europe.

*Table 3.  Alignment of Framework Identified Disciplines of Training with IPU Units and IPU Indicative Syllabus.*

| Framework Discipline | Corresponding IPU Unit(s) | IPU Indicative Syllabus |
|---|---|---|
| **1. Pharmacy Practice** | Receive, validate, and issue prescriptions; assemble & check dispensed medicines and products | • Governance requirements for receiving and validating prescriptions and issuing dispensed items<br>• Legislation that applies to assembling and checking dispensed medicines and products |
| | Undertake medicines reconciliation and supply | • Introduction to medicines reconciliation<br>• Governance requirements for retrieving and reconciling information about an individual's medicines, taking a medication history |

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| | Principles for the management of pharmaceutical stock | • Governance and legislative requirements for the management of pharmaceutical stock, procurement considerations, SOPs |
| | Principles of safe manufacture of quality medicines | • Governance requirements for the manufacture of pharmaceutical products |
| | Contribute to service improvement | • Clinical governance |
| **2. Mathematics** | *No direct standalone unit* | • N/A |
| **3. Pharmaceutical Technology and Formulation** | Principles of safe manufacture of quality medicines | • Demonstrated through practical compounding and product assembly in pharmacy settings under pharmacist supervision |
| **4. Fundamental Biological Sciences** | Medicinal & non-medicinal treatments: Different types of human cells and tissues | • Biology anatomy physiology |
| | Biological principles for pharmacy technicians | • Biochemistry and genetics |
| **5. Pharmacology, Toxicology and Therapeutics** | Actions and uses of medicines | • Pharmaceutics- dose forms<br>• Disease and disease mg<br>• Pharmacodynamics and kinetics and designing dosage regimens<br>• Personalised medicines<br>• Medicines optimisation<br>• Drug interactions<br>• Medicines information<br>• Evidence based medicine |

| | Medicinal treatments for cardio-respiratory conditions | • The respiratory and cardiovascular system and conditions and medicines used. |
|---|---|---|
| | Medicinal treatments for endocrine, gynaecological and genitourinary | • The lymphatic system<br>• The endocrine system and conditions and medicines used |
| | Medicinal and nonmedicinal treatments for CNS conditions | • Structure and function of the nervous system and conditions and medicines used |
| | Medicinal treatments for sensory organ conditions | • Ear, Nose, and Throat (ENT) and Skin and conditions and medicines used |
| | Treatments for malignant diseases and musculoskeletal conditions | • Introduction to the musculoskeletal system and its function<br>• Diseases of the musculoskeletal system<br>• Introduction to malignant disease |
| | Medicinal and non-medicinal treatments for GI & nutritional conditions | • The digestive system, conditions and medicines used |
| | Medicinal methods for the prevention, protection from and treatment of infections | • Blood - structure and function<br>• Common infections<br>• Medicines used to treat common infections |
| **6. Pathology (Non-Core)** | *No direct standalone unit* | *N/A* |
| **7. Microbiology and Aseptic Techniques** | Microbiology for pharmacy technicians | • Structure, function and classification of microorganisms |

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| **8. Chemistry** | Chemical principles for pharmacy technicians | <ul><li>The periodic table and explanation</li><li>Molecules and chemical bonding,</li><li>Equations for chemical reactions</li><li>Rates of reaction</li><li>Chemical and physical factors affecting rates of reaction</li><li>Basic pharmaceutics</li><li>Acid – base</li><li>Solubility and solutions</li><li>Emulsions</li><li>Suspensions</li><li>Solid dose forms</li></ul> |
| **9. Business and Administration (Non-Core)** | Principles for the management of pharmaceutical stock | <ul><li>Governance and legislative requirements for the management of pharmaceutical stock, procurement considerations, SOPs</li></ul> |
| | Contribute to service improvement | <ul><li>Clinical governance</li></ul> |
| **10. Professional Development (Non-Core)** | Principles of person-centred approaches for pharmacy technicians | <ul><li>Communication skills</li><li>Person centred communication</li><li>Diversity equality and inclusion</li><li>Safeguarding? Children first</li></ul> |
| | Personal development | <ul><li>The impact of statutory regulation in pharmacy services, evaluating your practice, reflective practice, improving practice and contributing to the development of others</li></ul> |

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| **11. Occupational Safety and Health Management (Non-Core)** | Principles of health and safety for pharmacy technicians | • Health and Safety |
| **12. Sustainability (Non-Core)** | *No direct standalone unit* | *N/A* |
| **13. Nutrition and Health (Non-Core)** | Principles of health promotion | • Factors impacting health and wellbeing, public health |

**1.2   EQF Level 5 and Above - Shared between Ireland and Portugal**

At EQF Level 5 and above, offered in countries such as Ireland and Portugal, the syllabus builds upon the foundational knowledge and skills established at Level 4, with greater depth, autonomy, and professional responsibility. Learners are expected to demonstrate enhanced scientific understanding in subjects such as pharmacology, microbiology, and physiology, alongside more advanced technical competence in areas including compounding and aseptic techniques.

The curriculum also incorporates research, data analysis, and problem-solving, fostering higher-order cognitive skills and preparing pharmacy technicians for specialised roles within practice settings.

Table 4 below summarises the curriculum domains identified within the framework (comprising 13 disciplinary areas) and the learning outcomes common to pharmacy technician programmes across the participating countries at EQF Levels 5 and 6. The table illustrates the progressive development of knowledge, skills, and professional behaviours that characterises pharmacy technician education in Europe.

*Table 4. 13 Disciplinary Areas in Pharmacy Technician Training/Education: Overview, Learning Outcomes, and Indicative Syllabi (Common to EQF Levels 5 - 6)*

| 1.2.1 Pharmacy Practice | |
|---|---|
| **Overview** | The structure, learning outcomes, and indicative syllabus for the Pharmacy Practice component at EQF Level 5 remain consistent with those defined at EQF Level 4. No additional details are required at this level. However, learners at EQF Level 5 are expected to apply their knowledge and skills with increased independence, confidence, and professionalism in the pharmacy environment, building on the foundational competencies developed at EQF Level 4. |
| **Learning Outcomes** | As outlined under EQF Level 4. |
| **Indicative Syllabus (Theory)** | As outlined under EQF Level 4. |
| **Indicative Syllabus (Laboratory)** | As outlined under EQF Level 4. |
| 1.2.2 Mathematics | |
| *1.2.2.1 Basic Maths* | |
| **Overview** | At EQF Level 5, mathematics continues to be delivered either as a standalone component or integrated across various subjects, depending on national or institutional curriculum structures within higher education. The focus at this level is to provide learners with a solid mathematical and statistical foundation for application in pharmacy and pharmaceutical sciences. This includes an adequate understanding of relevant quantitative methods to support areas such as pharmaceutical calculations, data analysis, and quality control within the healthcare and industrial pharmacy sectors. |
| **Learning Outcomes** | *Upon successful completion, learners will be able to:* |

|  | 1. Perform calculations involving fitting a line to linear data. |
| --- | --- |
|  | 2. Use basic statistics to analyse data. |
|  | 3. Solve problems using linear programming. |
|  | 4. Apply Differentiation and Integration techniques to solve simple problems. |
| **Indicative Syllabus (Theory)** | • Scientific notation, powers and logs: Exponential functions and natural logs, Equations with one or two unknown powers to Reduction of non-linear equations to linear forms. Examples pharmaceutical shelf-life estimation. |
|  | • Unit conversion, ppm, molecular mass calculations, dilutions and molarity (titration examples, dissociation of weak base/acid ($K_a$, $K_b$, etc), solubility). |
|  | • Fitting a line to linear data (calibration curves – absorbance versus concentration-estimation unknown). |
|  | • Statistics: Basic concepts of central tendency and spread such as the mean, mode, median, standard deviation, range with reference to ISO-3534 and ISO-5725 (Accuracy –Trueness and Precision). |
|  | • Probability: simple probability and combinations (with application to quality control), mutually exclusive and independent events. Sensory analysis examples. |
|  | • Linear programming: reviewing inequalities and simultaneous equations. Optimising profits and minimising cost with respect to linear constraints. Applications of linear programming with regard to ingredient blending for pharmaceutical products. |
|  | • Differentiation and Integration: Identifying of maxima, minima and inflexions. Introduction to partial differential equations. Definite and Indefinite Integrals, Area under a curve (AUC). |
| **Indicative Syllabus (Laboratory)** | N/A |

### 1.2.3 Pharmaceutical Technology and Formulation

| **Overview** | This component is included in full at EQF Level 4. No additional content is specified for EQF Level 5. |
| --- | --- |

| Learning Outcomes | As all intended learning outcomes for this component are addressed at EQF Level 4, no separate outcomes are included at this level. |
| --- | --- |
| Indicative Syllabus (Theory) | There is no further expansion of the syllabus at EQF Level 5, as the full scope of training for this component is covered at EQF Level 4. |
| Indicative Syllabus (laboratory) | There is no further expansion of the syllabus at EQF Level 5, as the full scope of training for this component is covered at EQF Level 4. |

### 1.2.4    Fundamental Biological Sciences

#### 1.2.4.1  Physiology

| Overview | This component builds upon the foundational understanding of human structure and function developed at EQF Level 4. It deepens learners' knowledge of the organisation and regulation of biological systems through a systematic study of mammalian physiology. Emphasis is placed on applying scientific enquiry and experimental methodology, including the interpretation of microscopical preparations and mammalian dissection. Where relevant and depending on the provider, additional biological contexts such as plant physiology and enzyme applications in biotechnology may be explored. |
| --- | --- |
| Learning Outcomes | *Upon successful completion, learners will be able to:*<br><br>1. Interpret microscopical preparations and mammalian dissection to understand the organisation and function of biological systems.<br><br>2. Demonstrate a conscientious and responsible attitude to the recording of experimental data.<br><br>***Depending on the country or the education provider, learners will be able to:***<br><br>3. Explain the mechanisms by which enzymes are regulated and provide examples of their industrial applications, including in biotechnology. |

| | 4. Describe aspects of plant histology and physiology, including leaf tissue function and the stages of photosynthesis. |
|---|---|
| **Indicative Syllabus (Theory)** | <ul><li>Plant histology and photosynthesis.</li><li>Enzyme structure and regulation; industrial uses of enzymes.</li></ul> |
| **Indicative Syllabus (laboratory)** | <ul><li>Deoxyribonucleic acid (DNA) isolation from Onion cells</li><li>Introduction to gel electrophoresis</li><li>Analysis of the effects of pH and temperature on salivary amylase</li><li>Plant histology transverse section dicot leaf</li><li>Animal histology 1: compact BONE transverse section, Haversian system</li><li>Animal histology 2: tissue plan, Gastrointestinal tract transverse section small intestine: ileum.</li><li>HP simple columnar epithelial cells including the goblet cells and crypts of Lieberkühn</li><li>Blood typing</li><li>Mammalian dissection: digestive, excretory, and reproductive systems</li></ul> |
| *1.2.4.2 Biology* | |
| **Overview** | This component builds upon the foundational biological knowledge developed at EQF Level 4. It further develops learners' understanding of cell structure, function, and diversity, expanding into areas such as genetics, taxonomy, histology, and homeostasis. Emphasis is placed on scientific methodology and laboratory skills, including microscopy and the interpretation of microscopic structures. The component provides a solid biological base to support further study in physiology and related biomedical sciences. |
| **Learning Outcomes** | *Upon successful completion, learners will be able to:*<br><br>1. Exhibit proficiency in microscopy by identifying cellular structures and microscopic organisms using theoretical and practical knowledge. |

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| | 2. Apply knowledge of SI units and surface area-to-volume ratios to explain biological processes at the microscopic scale. |
| | 3. Describe the principles of taxonomy and classification as they relate to cellular and organismal diversity. |
| | 4. Explain the role of histological structures and their relevance to tissue function and homeostasis. |
| | 5. Demonstrate a developing understanding of genetics and its application to cellular physiology. |
| **Indicative Syllabus (Theory)** | • DNA replication<br><br>• Cell cycle<br><br>• Microscopy<br><br>• Taxonomy<br><br>• Animal histology<br><br>• Homeostasis |
| **Indicative Syllabus (laboratory)** | • Training in recording scientific data through biological drawings<br><br>• Use, advantages, and limitations of the light microscope<br><br>• Preparation and observation of biological samples for light microscopy<br><br>• Observation and data recording of monoblastic, diploblastic, and triploblastic organisms<br><br>• Training and recording of a basic experimental procedure involving fungal systems |

### 1.2.5    Pharmacology, Toxicology and Therapeutics

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| **Overview** | At EQF Level 5, this component builds upon foundational knowledge established at Level 4 by providing a more detailed exploration of pharmacological principles and clinical applications. It focuses on drug targets in the human body and how these are addressed in the context of drug discovery and therapeutic use. |

|  | The component includes further examination of disease states across various body systems and the pharmacological management of these conditions. A particular emphasis is placed on the role of metabolic pathways, including the CYP450 enzyme system, and the clinical significance of enzyme inducers and inhibitors on drug concentration.<br><br>Learners will also be introduced to the broader context of drug development, including the design pipeline and ethical considerations such as clinical trials and global health priorities. The importance of pharmacovigilance continues to be addressed, alongside more advanced clinical applications relevant to patient care and counselling.<br><br>**Aims:**<br><br>The key aims of this component are introduced at EQF Level 4. At EQF Level 5, learners build on these foundations with a focus on advanced pharmacological applications, including drug metabolism and the role of enzyme modulation in therapeutic practice. |
|---|---|
| **Learning Outcomes** | *Upon successful completion, the learners will be able to:*<br><br>1. Describe the nature and effects of toxic agents including the impact of pharmacological agents and waste products on the environment.<br><br>2. Understand the processes involved in drug discovery, clinical trials, and pharmacovigilance.<br><br>3. Identify inducers and inhibitors of the CYP450 system and their clinical significance. |
| **Indicative Syllabus (Theory)** | Pharmacology<br><br>• Drug absorption (including blood-brain barrier), distribution, metabolism (CYP450 system; drug-drug interactions), and elimination<br><br>• Clinical trials<br><br>• Advanced pharmacovigilance<br><br>• Introduction to pharmacognosy<br><br>Toxicology<br><br>• Acute, sub-chronic and chronic toxicity; environmental toxicity |

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| | Drug design and development process. |
| **Indicative Syllabus (Laboratory)** | N/A |

### 1.2.6 Pathology

*At EQF Level 5, Pathology remains a non-standalone component. Selected pathology-related topics may be included within other components, similar to EQF Level 4. For detailed learning outcomes and indicative syllabus related to pathology, please refer to the information provided at EQF Level 4, as no additional pathology content is specified at EQF Level 5.*

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| **Overview** | N/A |
| **Learning Outcomes** | N/A |
| **Indicative Syllabus** | N/A |

### 1.2.7 Microbiology and Aseptic Techniques

#### 1.2.7.1 General Microbiology

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| **Overview** | At EQF Level 5, this component provides learners with a more in-depth understanding of microbiology and aseptic techniques within pharmacy and healthcare settings. Building on foundational microbiological principles, the component covers microbial classification, growth, and control in greater detail, with an emphasis on pharmaceutical relevance. Learners will explore infection control, microbial contamination, sterilisation methods, and cleanroom practices. The component also introduces immunology and environmental microbiology, with a focus on bioremediation and sustainable microbiological practices. Additionally, the principles and practice of sterile manufacturing, including regulatory and QA considerations, will be addressed. This comprehensive training aims to equip learners with the knowledge and skills required to maintain microbial safety and quality in pharmaceutical environments. |

| Learning Outcomes | *Upon successful completion, learners will be able to:* |
|---|---|
| | 1. Describe the *roles* of microorganisms in ecosystems, human health, sustainability, and bioremediation. |
| | 2. Identify microorganisms of significance to healthcare and the pharmaceutical industry and explain their role as pathogens and contaminants. |
| | 3. Outline the importance of infection control in the health care setting. |
| | 4. Discuss environmental causes that influence microbial growth. |
| | 5. Demonstrate competency in core pharmaceutical microbiology techniques, including environmental monitoring, water testing, product analysis, and cleanroom gowning. |
| | 6. Accurately interpret, document, and communicate microbiological findings from laboratory experiments. |
| Indicative Syllabus (Theory) | • Introduction to immunology. |
| | • Microbial ecosystems: introduction to the microbiology of water, air, food, surfaces and the microbiome of human and other hosts. Bioremediation: sustainable management of contaminants. |
| | • Microbial groups significant to the pharmaceutical industry: as causative agents of disease, contaminants, and producers of pharmaceutical products, bacterial toxins, bacterial genetics. |
| | • Microbial products: introduction to antibiotics and antibiotic-resistant. |
| | • Health Care Associated Infections (HCAI): major health care-associated infections, factors determining HCAI, most common HAI infectious agent, sources, routes of infection, and prevention. |
| | • Categories of pharmaceutical products I: sterile products. Categories of pharmaceutical products II: non-sterile products. |
| | • Sterilisation methods used in the pharmaceutical industry: control of microbial growth, biological indicators, steam sterilisation (autoclaving), dry heating, ethylene oxide, gamma or electron radiation, filtration. |
| | • Contamination control in the manufacturing environment (Environmental Monitoring): personal, structural and operational hygiene, environmental monitoring methods: settle plates, active air samplers, surface sampling, personnel monitoring. |

| | |
|---|---|
| | • Pharmaceutical water system: types of water used in pharmaceutical manufacturing, water system contamination, design and control of water system, monitoring water system: sampling, testing and reporting.<br><br>• Standard analytical methods used in pharmaceutical microbiology. Relevant standards. |
| **Indicative Syllabus (Laboratory)** | • Aseptic techniques<br><br>• Microscopy<br><br>• Evaluation of growth media<br><br>• Assessment of factors affecting microbial growth<br><br>• Bacterial groups<br><br>• Environmental monitoring: air and surface contamination<br><br>• Assessment of water contamination<br><br>• Clean room gowning *(this varies depending on the education providers)* |

### 1.2.8    Chemistry

*At EQF Level 5, the Chemistry component builds upon the foundational knowledge and skills introduced at Level 4. While Level 4 focused on general chemical principles and essential laboratory practices without distinguishing between branches of chemistry, this level introduces learners to the distinct areas of Inorganic Chemistry and Organic Chemistry.*

#### 1.2.8.1    *Inorganic Chemistry*

| | |
|---|---|
| **Overview** | Chemistry is a vital and dynamic science. It is of fundamental importance to all the other sciences, modern technology and to any explanation of the composition of material things around us and particularly to the proper understanding of pharmaceuticals. This component aims to impart a knowledge and understanding of the basic principles of chemistry and explain why chemistry is an integral activity for addressing social, economic, and environmental problems.  Equips the student with the practical skills of experimentation and to develop the expertise of designing simple experiments in a sustainable way with a view to testing theory. |

| Learning Outcomes | *Upon successful completion, learners will be able to:* |
|---|---|
| | 1. Understand the concept of chemical bonding. |
| | 2. Name and formularise basic chemical compounds. |
| | 3. Identify, differentiate between green and non-green experimental processes. (this varies depending on the education provider). |
| | 4. Identify the 12 green principles of chemistry *(this varies depending on the education provider)*. |
| Indicative Syllabus (Theory) | • Chemical bonding and nomenclature |
| | • Stoichiometry and the mole solutions chemical reactions nonmetals |
| | • Main group chemistry |
| | • Water chemistry |
| | • Chemistry of the environment |
| | • Chemistry of medicinal compounds |
| | • Chemistry of Food *(this varies depending on the education provider)* |
| Indicative Syllabus (Laboratory) | • Measurements with mass and volume |

### 1.2.8.2    Organic Chemistry

| Overview | A comprehensive knowledge of organic chemistry is vital to the understanding of biological sciences, and pharmaceuticals. The applications of organic chemistry are diverse. Areas such as food production, pharmaceutical developments, energy, pollution and sustainability of resources are understood better with a competency in carbon chemistry. In this component, the underlying principles of organic chemistry will be delivered. Learners will learn and understand the nomenclature, classification, structure and properties of common organic compounds. Furthermore, the component will introduce key basic reactions and the syntheses of fundamental organic compounds. Additionally, learners will develop an understanding of the underlying principles and the ability to predict organic reactions. Finally, |
|---|---|

|  | to supplement and reinforce chemical principles delivered in the theory, learners will become competent in experimental design, manipulation, and correct use of laboratory equipment and proper recording of results in the foundation organic chemistry laboratory, whilst simultaneously developing good laboratory practice and technical skills relevant to industry. |
|---|---|
| **Learning Outcomes** | *Upon successful completion, learners will be able to:* <br><br> 1. Be capable of correctly drawing the structures of organic functional groups and reproducing their associated chemical properties. <br><br> 2. Recognise and identify common functional groups and name simple organic compounds using the International Union of Pure and Applied Chemistry (IUPAC) system. <br><br> 3. Demonstrate understanding of the main organic chemical reactions and the reaction mechanisms underlying these processes. <br><br> 4. Use hybridisation theory to explain the shape, structure and relative reactivity of simple organic compounds. <br><br> 5. Discuss polarity and intermolecular interactions and use these to predict or account for the observed physical properties of simple organic compounds. <br><br> 6. Describe the physical properties, chemical reactions and applications of common organic functional groups. <br><br> 7. Develop graduate attributes appropriate to their programme of study by participating effectively in group work, problem solving and peer teaching through participation in class activities, lab practical sessions and in online environments. <br><br> 8. Be familiar with, and capable of handling, laboratory equipment with confidence. <br><br> 9. Be competent in organising an experiment and achieving an accurate result in a safe manner. <br><br> 10. Have a developed aptitude for experimental design and the ability to critically assess experiments for sustainability. <br><br> 11. Apply numerical and data manipulation skills, appropriate to the pharmacy technician programme of study, in the laboratory and also with theoretical concepts. |

| | |
|---|---|
| **Indicative Syllabus (Theory)** | • Introduction to organic chemistry and classification of organic compounds.<br><br>• IUPAC nomenclature for the fundamental functional groups (alkanes, alkenes, alkynes, alcohols, carboxylic acids, carbohydrates, aldehydes and ketones, benzene and aromatic compounds).<br><br>• Hybridisation theory in relation to organic compounds.<br><br>• Chemical reactions, physical properties, and applications of simple organic molecules.<br><br>• Structural isomers.<br><br>• Intermolecular forces.<br><br>• Basic stereochemistry of organic compounds.<br><br>• Introduction to fundamental reaction mechanisms.<br><br>• Functional group chemistry including applications and reactions of compounds containing each of the following functional groups: alcohols, aldehydes, ketones, carboxylic acids and derivatives, and haloalkanes. |
| **Indicative Syllabus (Laboratory)** | • Melting & boiling point determination and liquid-liquid separation<br><br>• Classification and identification of hydrocarbons<br><br>• Recrystallisation, synthesis and molecular modelling<br><br>• Classification and identification of molecule groups (e.g., alcohols and phenols, aldehydes and ketones)<br><br>• Thin layer chromatography (TLC) of pharmaceuticals<br><br>• Properties and reactions of multiple molecule groups e.g., carboxylic acids and esters<br><br>• Extraction techniques |

### 1.2.9    Business and Administration

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|---|---|
| **Overview** | This component is included in full at EQF Level 4. No additional content is specified for EQF Level 5. |

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| **Learning Outcomes** | As all intended learning outcomes for this component are addressed at EQF Level 4, no separate outcomes are included at this level. |
| **Indicative Syllabus (Theory)** | There is no further expansion of the syllabus at EQF Level 5, as the full scope of training for this component is covered at EQF Level 4. |
| **Indicative Syllabus (Laboratory)** | N/A |

### 1.2.10   Professional Development (Non-Core)

| | |
|---|---|
| **Overview** | This component is included in full at EQF Level 4. No additional content is specified for EQF Level 5. |
| **Learning Outcomes** | As all intended learning outcomes for this component are addressed at EQF Level 4, no separate outcomes are included at this level. |
| **Indicative Syllabus (Theory)** | There is no further expansion of the syllabus at EQF Level 5, as the full scope of training for this component is covered at EQF Level 4. |
| **Indicative Syllabus (Laboratory)** | N/A |

### 1.2.11   Occupational Safety and Health Management (Non-Core)

*(This component is included in some national or institutional programmes, depending on local requirements)*

| | |
|---|---|
| **Overview** | This component is included in full at EQF Level 4. No additional content is specified for EQF Level 5. |
| **Learning Outcomes** | As all intended learning outcomes for this component are addressed at EQF Level 4, no separate outcomes are included at this level. |

| | |
|---|---|
| **Indicative Syllabus (Theory)** | There is no further expansion of the syllabus at EQF Level 5, as the full scope of training for this component is covered at EQF Level 4. |
| **Indicative Syllabus (Laboratory)** | N/A |

### 1.2.12   Sustainability (Non-Core)

*(This component is included in some national or institutional programmes, depending on local requirements)*

| | |
|---|---|
| **Overview** | This component is included in full at EQF Level 4. No additional content is specified for EQF Level 5. |
| **Learning Outcomes** | As all intended learning outcomes for this component are addressed at EQF Level 4, no separate outcomes are included at this level. |
| **Indicative Syllabus (Theory)** | There is no further expansion of the syllabus at EQF Level 5, as the full scope of training for this component is covered at EQF Level 4. |
| **Indicative Syllabus (Laboratory)** | N/A |

### 1.2.13   Nutrition and Health (Non-Core)

*(This component is included in some national or institutional programmes, depending on local requirements)*

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|---|---|
| **Overview** | This component provides an in-depth exploration of the principles, foundations, and practical applications of optimal human nutrition for health promotion, disease prevention, and clinical treatment. |
| | It allows the development of knowledge and awareness of the national healthy eating guidelines, the macro and micronutrients, their sources, biological function, interactions and deficiency diseases. It also provides an integrated overview of how sustainable nutrition and healthy sustainable diets, in terms of nutrient profile can, prevent or treat a range of conditions, including diseases which are genetic, chronic degenerative and those caused by malnutrition. |

|  | Thereby this topic addresses the UN-SDGs 2 and 3. Food and nutrient intakes or deficiencies and their relation to disease prevention and treatment are analysed with focus on practices such as individual's dietary intake and diet modification (e.g. recipe, menu and diet analysis, modification, reformulation) associated with disease prevention and treatment. |
|---|---|
| **Learning Outcomes** | *Upon successful completion, learners will be able to:*<br><br>1. Critically evaluate national and international sustainable dietary guidelines, including their development, implementation, and relevance to public health nutrition and policy.<br><br>2. Integrate and apply advanced knowledge of nutrient and non-nutrient interactions, sustainable dietary practices, and their roles in the prevention and management of chronic diseases within diverse populations.<br><br>3. Understand and identify therapeutic dietary models and novel medicinal dietary products which aid prevention or treatment of disease states.<br><br>4. Evaluate biological and clinical indices to allow interpretation of appropriate therapeutic dietary responses to defined health problems.<br><br>5. Demonstrate a knowledge of nutritional analysis methodologies and tools (software), with a view to analysing, calculating and presenting nutrient intake data and information (numerical) and comparing with Recommended Daily Allowances (RDAs, numerical).<br><br>6. Provide an opportunity for learners to develop the skills of self-awareness, self-reflection and self-management while developing their knowledge base which in turn will allow the transfer of skills to practise related scenarios. |
| **Indicative Syllabus (Theory)** | • Overview of nutritional research, terminology, RDAs, phytochemicals, nutritional research, dietary analysis methodologies.<br><br>• Healthy eating guidelines, food pyramid, UN-SDGs, WHO guidelines.<br><br>• Macronutrients: Energy density, dietary sources, biological functions, deficiency and toxicity, RDAs.<br><br>• Micronutrients: dietary sources, biological functions, deficiency and toxicity, RDAs, nutrient, non-nutrient, drug interactions.<br><br>• Traffic light system and nutri-score, quality calorie concept, allergen labelling, development of a nutrient panel. |

| | |
|---|---|
| | • Food allergies and intolerance: aetiology, symptoms, diagnosis, treatment.<br><br>• Gastrointestinal diseases: aetiology, symptoms, diagnosis, treatment, coeliac disease, diverticular disease, irritable bowel syndrome.<br><br>• Osteoporosis: aetiology, symptoms, diagnosis, treatment.<br><br>• Cardiovascular disease: aetiology, symptoms, diagnosis, treatment.<br><br>• Anaemia and haemochromatosis: aetiology, symptoms, diagnosis, treatment.<br><br>• Inborn errors of metabolism: aetiology, symptoms, diagnosis, treatment. |
| **Indicative Syllabus (Laboratory)** | N/A |

### 1.3 EQF Level 6 – Predominantly Portugal, Partial Coverage in Ireland

At EQF Level 6, the curriculum reflects the increasing autonomy, responsibility, and professional expertise expected of pharmacy technicians. Learners engage with advanced clinical practice, evidence-based decision-making, QA, protocol development, and research literacy. The syllabus also integrates business management, sustainability, and professional autonomy, preparing graduates to contribute strategically to healthcare delivery, leadership, and innovation within pharmacy practice.

In Ireland, the pharmacy technician qualification is typically achieved at EQF Level 5. A few higher education institutions offer programmes at EQF Level 6, primarily for upskilling and advanced professional development. These programmes build upon foundational and intermediate competences, supporting career progression and enabling technicians to assume more specialised, supervisory, or managerial roles. Examples include the BSc in Pharmacy Technician [15] and similar programmes exemplify this pathway, integrating scientific, clinical, and professional domains consistent with the framework presented below.

In Portugal, comparable advanced education extends to EQF Level 6, reflecting higher academic progression and further professional specialisation beyond standard pharmacy technician training.

Table 5 below summarises the curriculum domains identified within the framework (comprising 26 disciplinary areas) and the learning outcomes common to pharmacy technician programmes at EQF Level 6. The table illustrates the culmination of progressive development in knowledge, skills, and professional behaviours at advanced levels of European pharmacy technician education.

*Table 5. 26 Disciplinary Areas in Pharmacy Technician Training/Education: Overview, Learning Outcomes, and Indicative Syllabi (at EQF Level 6)*

| 1.3.1     **Pharmacy Practice** |
| --- |

| **Overview** | Building on the foundational knowledge developed at EQF Level 4 and the applied competencies gained at EQF Level 5, Pharmacy Practice component at the EQF Level 6 focuses on the advanced integration and professional application of pharmacy-related knowledge and skills. At this level, learners are expected to demonstrate increased autonomy, critical thinking, and professional judgement in the delivery of pharmacy services. They should be capable of managing complex and evolving responsibilities within a pharmacy setting, contributing to QA, supporting regulatory compliance, and engaging in interprofessional collaboration. |
| --- | --- |
| | This level also places a strong emphasis on patient-centred care, leadership, effective communication, and reflective practice. Learners are expected to take initiative, adapt to new challenges, and actively contribute to improving pharmaceutical services and public health outcomes. On completion, learners should be able to operate confidently and independently as competent pharmacy technicians, ready to meet the demands of a dynamic and increasingly interdisciplinary healthcare environment. |
| | ***^The following discipline overviews are derived from an EQF Level 6 programme currently offered in Ireland. In the Irish context, EQF Level 6 represents an upskilling or advanced training route for pharmacy technicians, providing enhanced professional competencies beyond the baseline qualification required for practice.*** |
| | ^The aim of this discipline is to ensure pharmacy technicians in community, hospital, regulation, industry, education and wholesale divisions constantly strive to update themselves as the framework for pharmacy practice is changing. Advanced pharmacy skills look at a unique way of empowering the pharmacy technician. There are many opportunities for pharmacy technicians to engage in new ways of working outside the developed areas which are covered elsewhere within this course. |

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| | ^Medicines management encompasses the entire way that medicines are selected, procured, delivered, prescribed, administered and reviewed to optimise the contribution that medicines make to producing informed and desired outcomes of patient care. The aim of this component is to provide students with an overview of all aspects of medicines management and how it pertains to the role of the pharmacy technician.<br><br>^Medicines optimisation is defined as a person-centred approach to safe and effective medicines use, to ensure people obtain the best possible outcomes from their medicines. Medicines optimisation considers the value which medicines deliver to ensure they are clinically-effective and cost-effective. The aim of this component is to provide students with a comprehensive overview of medicines optimisation and to impart the key skills and knowledge necessary to integrate medicines optimisation principles into their practice as pharmacy technicians. |
| **Learning Outcomes** | *As outlined under EQF Level 4.*<br><br>*^**The following discipline learning outcomes are derived from an EQF Level 6 programme currently offered in Ireland. In the Irish context, EQF Level 6 represents an upskilling or advanced training route for pharmacy technicians, providing enhanced professional competencies beyond the baseline qualification required for practice.***<br><br>*^Advanced Pharmacy Skills*<br>• *Critique the move forward of information technology within healthcare.*<br>• *Propose a business case for a new service demonstrating research and writing skills.*<br>• *Prioritise medicines information queries after locating, assessing and interpreting the information.*<br>• *Analyse the range of communication skills necessary to enhance a positive patient outcome.*<br>• *Develop a style of reflection that allows for enhanced learning of a healthcare professional.*<br><br>*^Medicine Management:*<br>• *Discuss the policies and guidelines central to strategic medicines management.* |

|  |  |
|---|---|
|  | • *Demonstrate the principles of pharmaceutical care in dealing with patients.*<br><br>• *Employ advanced clinical pharmacy skills and expertise in patient care.*<br><br>• *Apply the principles of medication management in order to optimise the contribution that medicines make to patient care.*<br><br>*^Medicines Optimisation*<br><br>• *Investigate the patient's experience of medicine use and develop advanced approaches to patient counselling.*<br><br>• *Utilise appropriate evidence to support all clinical decisions.*<br><br>• *Integrate medication safety into all aspects of pharmacy technician practice.*<br><br>• *Discuss the importance of pharmacoeconomics in the Irish healthcare system.* |
| **Indicative Syllabus (Theory)** | *As outlined under EQF Level 4.* |
| **Indicative Syllabus (Laboratory)** | *As outlined under EQF Level 4.* |

### 1.3.2     Mathematics

#### 1.3.2.1     *Basic Maths*

| Overview | The structure, learning outcomes, and indicative syllabus for the basic maths component at EQF Level 6 remain consistent with those defined at EQF Levels 4 and 5. |
|---|---|
| **Learning Outcomes** | *As outlined under EQF Levels 4 and 5.* |
| **Indicative Syllabus (Theory)** | *As outlined under EQF Levels 4 and 5.* |

| Indicative Syllabus (Laboratory) | N/A |
|---|---|
| **1.3.2.2    Biostatistics**<br>*(This component is included in some national or institutional programmes, depending on local requirements)* ||
| **Overview** | This component aims to provide learners with the skills needed to understand the theoretical models used in statistical analysis, as well as to analyse and interpret the results obtained from data. Learners will gain proficiency in using the SPSS software to solve problems involving the concepts introduced throughout the course.<br><br>Covers descriptive statistics, where learners will learn to understand statistical concepts and explore statistical measures. |
| **Learning Outcomes** | *Upon successful completion, learners will be able to:*<br>1. Understand the underlying conditions for applying theoretical models used in statistical analysis.<br>2. Analyse and interpret the results obtained from statistical methods.<br>3. Learn to use SPSS software to solve problems related to the concepts covered.<br>4. Acquire the fundamental competencies required to conduct quantitative data analysis.<br>5. Critically assess and interpret the results of inferential studies appropriately. |
| **Indicative Syllabus (Theory)** | <ul><li>Descriptive *statistics*.</li><li>Population, sample, and individual.</li><li>Frequency tables and graphical data representation.</li><li>Statistical measures: central tendency, dispersion, skewness, and kurtosis.</li><li>Correlation and regression analysis models.</li><li>Hypothesis Testing and Statistical hypotheses.</li><li>Parametric tests: t-test, two-sample t-test, one-way ANOVA.</li></ul> |

| | |
|---|---|
| | • Non-parametric tests: paired samples (Friedman, Wilcoxon, McNemar); independent samples (Mann-Whitney U, Kruskal-Wallis H).<br><br>• Association and Correlation Tests: Techniques for measuring relationships and associations between variables. |
| **Indicative Syllabus (Laboratory)** | N/A |

### 1.3.3    Pharmaceutical Technology and Formulation

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|---|---|
| **Overview** | The structure and content of the Pharmaceutical Technology and Formulation component remain consistent with those delivered at EQF Levels 4 and 5. At EQF Level 6, learners are expected to apply this knowledge with greater independence and professional judgement, demonstrating a higher level of confidence, critical thinking, and contextual awareness in pharmaceutical formulation and manufacturing processes. |
| **Learning Outcomes** | *As outlined under EQF Levels 4 and 5.* |
| **Indicative Syllabus (Theory)** | *As outlined under EQF Levels 4 and 5.* |
| **Indicative Syllabus (Laboratory)** | *As outlined under EQF Levels 4 and 5.* |

### 1.3.4    Fundamental Biological Sciences

#### 1.3.4.1    *Physiology*

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|---|---|
| **Overview** | The Physiology component at EQF Level 6 continues to build on the detailed understanding of human and mammalian biological systems developed at earlier levels. While the core content remains consistent with Levels 4 and 5, learners at Level 6 are expected to engage with the material more independently, demonstrating advanced critical thinking, scientific enquiry, and practical skills in the analysis and interpretation of physiological data. |

| | |
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| | Depending on the provider, exploration of additional biological contexts such as human/plant physiology and enzyme applications may also continue. |
| **Learning Outcomes** | *As outlined under EQF Levels 4 and 5.* |
| **Indicative Syllabus (Theory)** | *As outlined under EQF Levels 4 and 5.* |
| **Indicative Syllabus (Laboratory)** | N/A |
| *1.3.4.2   Biology* | |
| **Overview** | The Biology component at EQF Level 6 builds on the comprehensive knowledge and skills acquired at Levels 4 and 5. While the core content remains consistent, learners at this level are expected to demonstrate greater independence and critical analysis in applying biological concepts. Emphasis is placed on advanced scientific inquiry and laboratory techniques, fostering the ability to interpret complex biological data and support further specialised study in related biological sciences. |
| **Learning Outcomes** | *As outlined under EQF Levels 4 and 5.* |
| **Indicative Syllabus (Theory)** | *As outlined under EQF Levels 4 and 5.* |
| **Indicative Syllabus (Laboratory)** | *As outlined under EQF Levels 4 and 5.* |
| **1.3.5   Pharmacology, Toxicology and Therapeutics** | |
| **Overview** | At EQF Level 6, learners are expected to consolidate and apply the pharmacological and therapeutic knowledge acquired at Levels 4 and 5 with greater independence, clinical awareness, and critical thinking. While no new subcomponents are introduced at this level, learners are expected to demonstrate an enhanced ability to integrate |

|  | knowledge of drug mechanisms, toxicological profiles, and therapeutic strategies in more complex and nuanced clinical scenarios.

This includes evaluating medication-related risks, interpreting drug interactions within multi-drug regimens, and supporting the safe and effective use of medicines in diverse patient populations. A strong emphasis is placed on patient-centred care, collaborative practice, and evidence-based decision-making. Learners should also be able to reflect critically on ethical issues related to medication safety, drug use in vulnerable populations, and the global impact of pharmacological interventions. By the end of Level 6, learners should be able to apply pharmacological principles to support advanced pharmacy practice, contribute to clinical discussions, and uphold high standards in therapeutic safety and efficacy.

*Note: At this level in Portugal, pharmacology, toxicology, and pharmacotherapy are delivered as distinct modules, allowing learners to explore each area in greater depth and with focused academic and practical outcomes.*

*^The following discipline overview is derived from an EQF Level 6 programme currently offered in Ireland. In the Irish context, EQF Level 6 represents an upskilling or advanced training route for pharmacy technicians, providing enhanced professional competencies beyond the baseline qualification required for practice.*

^Clinical pharmacy is the science and practice of rational medication use while pharmaceutical care is the responsible provision of drug therapy for the purpose of achieving definite outcomes that improve a patient's quality of life. This component (Clinical Pharmacy and Pharmaceutical Care) aims to provide students with a comprehensive understanding of the use of drugs in patient-centred care. This component focuses on the pharmacological areas outlined in the indicative syllabus. |
| **Learning Outcomes** | *As outlined under EQF Levels 4 and 5.*

*^The following discipline learning outcomes are derived from an EQF Level 6 programme currently offered in Ireland. In the Irish context, EQF Level 6 represents an upskilling or advanced education route for pharmacy* |

<table>
<tr>
<td colspan="2"><em><u>technicians, providing enhanced professional competencies beyond the baseline qualification required for practice.</u></em><br><br><em>^Clinical Pharmacy and Pharmaceutical Care</em>
<ol>
<li>Describe the aetiology and pathophysiology of medical conditions.</li>
<li>Outline the pharmacological and interventional approaches used in the treatment of disease.</li>
<li>Discuss the indications, administration, mechanism of action, adverse effects, interactions, contraindications and cautions of drugs in use.</li>
<li>Counsel patients on the safe and effective use of medicines.</li>
<li>Describe the aetiology and pathophysiology of medical conditions.</li>
<li>Outline the pharmacological and interventional approaches used in the treatment of disease.</li>
<li>Discuss the indications, administration, mechanism of action, adverse effects, interactions.</li>
</ol>
</td>
</tr>
<tr>
<td><strong>Indicative Syllabus (Theory)</strong></td>
<td><em>As outlined under EQF Levels 4 and 5.</em></td>
</tr>
<tr>
<td><strong>Indicative Syllabus (Laboratory)</strong></td>
<td>N/A</td>
</tr>
<tr>
<td colspan="2"><strong>1.3.6   Pathology</strong></td>
</tr>
<tr>
<td><strong>Overview</strong></td>
<td>This component provides learners with essential knowledge of major physiological systems and their associated pathologies, including the central nervous, musculoskeletal, circulatory, urological, reproductive, digestive, endocrine, and respiratory systems. Learners will learn to recognise and describe key symptoms and signs of common diseases.</td>
</tr>
</table>

| | |
|---|---|
| | A strong emphasis is placed on understanding pathological mechanisms, clinical reasoning, and decision-making. Learners will develop the ability to identify key diagnostic and prognostic indicators, differentiate between normal and abnormal function, and evaluate appropriate diagnostic exams and treatment options. |
| **Learning Outcomes** | *Upon successful completion, learners will be able to:* <br><br> 1. Identify the aetiology, epidemiology, prognosis, and treatment options for prevalent diseases. <br><br> 2. Apply critical thinking and clinical reasoning to make informed decisions in patient assessment and referral. <br><br> 3. Develop autonomy and responsibility in advising on disease management and treatment pathways. |
| **Indicative Syllabus (Theory)** | • Correlation between clinical signs, symptoms, diagnostic tests, treatment, and specialised interventions <br><br> • Differentiation between normal and pathological functions of the central nervous, musculoskeletal, circulatory, urinary, reproductive, digestive, and endocrine systems <br><br> • Identification of common pathological conditions, their aetiology, epidemiology, symptoms, prognosis, and treatment <br><br> • Recognition of key diagnostic tests for each pathological condition |
| **Indicative Syllabus (Laboratory)** | NA |

### 1.3.7    Microbiology and Aseptic Techniques

#### 1.3.7.1    *General Microbiology*

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|---|---|
| **Overview** | This component provides an overview of the microbiology of parasitology. It explores the classification, morphology, physiology, and pathogenic mechanisms of microorganisms, along with their interactions with the host and immune system. Key infectious agents, antimicrobial therapies, and resistance mechanisms are addressed. |

**PharmTech Mobility – Enhancing European Pharmacy Technician Exchange and Mobility**

|  | *Note: At this level, microbiology and aseptic techniques are delivered as distinct modules, allowing learners to explore each area in greater depth and with focused academic and practical outcomes.* |
|---|---|
| **Learning Outcomes** | *Upon successful completion, learners will be able to:*<br><br>1. Understand the classification and pathogenic mechanisms of viruses, bacteria, fungi, and parasites.<br><br>2. Identify the main viral, bacterial, fungal, and parasitic diseases and understand their transmission, pathogenesis, and the role of host interactions.<br><br>3. Develop an understanding of the mechanisms of action and resistance to antimicrobial agents, including antibiotics, antivirals, antifungals, and antiparasitics.<br><br>4. Interpret laboratory results using biochemical, molecular, and rapid identification tests for microorganisms.<br><br>5. Understand the role of microbiota in health and disease, and the environmental factors that affect microbial populations. |
| **Indicative Syllabus (Theory)** | • Pathogenicity and host-bacteria interaction<br><br>• Microbiome, infection and immune response<br><br>• Antibacterial agents and resistance mechanisms<br><br>• Mycology: fungal pathogenesis and antifungal agents<br><br>• Parasitology: pathogenesis of parasitic diseases and antiparasitic agents<br><br>• Antimicrobial susceptibility testing<br><br>• Evaluation of antimicrobial resistance |
| **Indicative Syllabus (Laboratory)** | As outlined under EQF Level 5. |
| *1.3.7.2    Aseptic Techniques* | |

| Overview | This component provides learners with essential knowledge and practical skills in pharmaceutical compounding, covering best practices for handling sterile and non-sterile medications in accordance with international guidelines. Topics include disinfection principles, cytostatic drug preparation for chemotherapy, parenteral nutrition (types, routes, stability, and complications), and quality control in pharmaceutical compounding. The subject also addresses the management of toxic and non-toxic residues in pharmaceutical manufacturing.<br><br>^*The following discipline overview is derived from an EQF Level 6 programme currently offered in Ireland. In the Irish context, EQF Level 6 represents an upskilling or advanced training route for pharmacy technicians, providing enhanced professional competencies beyond the baseline qualification required for practice.*<br><br>^*The aim of this discipline (Aseptic Practices) is to provide students with an overview of aseptic practices and techniques and how they relate to the role of the pharmacy technician. The component also aims to equip students with the theoretical underpinnings of aseptic practices while developing their practical skills in the aseptic manipulation of pharmaceutical preparations.* |
|---|---|
| Learning Outcomes | *Upon successful completion, learners will be able to:*<br><br>1. Understand the quality and safety aspects of the preparation of pharmaceutical formulations.<br>2. Identify and apply aseptic techniques to ensure quality at all stages of sterile and non-sterile medication preparation.<br>3. Recognise key principles in patient assessment for chemotherapy and parenteral nutrition.<br>4. Understand the complexity and responsibility associated with handling cytotoxic drugs and parenteral nutrition.<br>5. Properly employ aseptic techniques in the preparation of intravenous mixtures.<br><br>^*The following discipline learning outcomes are derived from an EQF Level 6 programme currently offered in Ireland. In the Irish context, EQF Level 6 represents an upskilling or advanced training route for pharmacy technicians, providing enhanced professional competencies beyond the baseline qualification required for practice.* |

| | |
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| | ^*Aseptic Practices*<br><br>• *Apply the theory of sterile compounding to the aseptic preparation and dispensing of pharmaceutical products.*<br><br>• *Demonstrate appropriate procedures and techniques for operator and product preparation, and routine compounding tasks in a simulated aseptic compounding environment.*<br><br>• *Implement and comply with national guidelines and quality standards for aseptic compounding in pharmacy practice.*<br><br>• *Complete calculations required for the preparation, reconstitution and administration of pharmaceutical dosage forms in the aseptic environment.* |
| **Indicative Syllabus (Theory)** | • International guidelines for sterile and non-sterile compounding<br><br>• Quality control procedures for sterile and non-sterile compounded medications<br><br>• Disinfectants and antiseptics: Definition, classification, and uses<br><br>• Precautions and risks associated with disinfection procedures<br><br>• Cytostatic drug preparation (chemotherapy): principles and objectives, mechanism of action and classification of cytostatic drugs<br><br>• Parenteral nutrition: definition, objectives, and indications, types and administration routes of PN, stability and compatibility of nutritional mixtures, potential complications of parenteral nutrition |
| **Indicative Syllabus (Laboratory)** | • Use and understanding the importance of Personal Protective Equipment in pharmaceutical handling.<br><br>• Preparation of sterile and non-sterile formulation<br><br>• Apply aseptic techniques to prevent contamination in drug preparation<br><br>• Test and evaluate different disinfectants and antiseptics, learning their appropriate use in pharmaceutical environments. |

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| | • Simulation of the preparation of cytostatic drugs used in chemotherapy, following strict safety protocols (handling hazardous substances, using protective equipment, and preparing drug reconstitution under controlled conditions). <br><br> • Formulation of intravenous nutritional mixtures, assess their stability, and ensure compatibility. |
| **1.3.8    Chemistry** | |
| *1.3.8.1    Inorganic Chemistry* | |
| **Overview** | The Inorganic Chemistry component at EQF Level 6 continues to build upon the foundational principles introduced at Level 5. Learners are expected to deepen their understanding of chemical concepts and their relevance to pharmaceutical sciences. Emphasis is placed on the independent application of theoretical knowledge and the design of sustainable experimental procedures. This level fosters critical thinking and problem-solving skills essential for addressing complex scientific and societal challenges. |
| **Learning Outcomes** | *As outlined under EQF Level 5.* |
| **Indicative Syllabus (Theory)** | *As outlined under EQF Level 5.* |
| **Indicative Syllabus (Laboratory)** | *As outlined under EQF Level 5.* |
| *1.3.8.2    Organic Chemistry* | |
| **Overview** | At EQF Level 6, the Organic Chemistry component builds on the foundational knowledge established at Level 5. Learners are expected to deepen their understanding of organic compounds, reactions, and synthesis, applying theoretical principles with greater independence and critical analysis. Emphasis is placed on enhancing practical laboratory skills, including experimental design and data interpretation, while maintaining good laboratory |

| | practices relevant to the pharmaceutical and chemical industries. This level fosters the ability to apply organic chemistry concepts to solve problems in pharmaceutical sciences and related fields. |
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| **Learning Outcomes** | *As outlined under EQF Level 5.* |
| **Indicative Syllabus (Theory)** | *As outlined under EQF Level 5.* |
| **Indicative Syllabus (Laboratory)** | *As outlined under EQF Level 5.* |

| 1.3.8.3     *Analytical Chemistry* | |
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| **Overview** | This component provides leaners with foundational knowledge and practical skills in analytical chemistry, focusing on pharmaceutical applications. Leaners will learn key concepts in quality control, method validation, and laboratory accreditation, alongside the principles of various analytical techniques. Through laboratory work, leaners will apply these techniques to perform qualitative and quantitative analyses of pharmaceutical substances, prepare solutions, and interpret experimental data according to pharmacopeial standards and good laboratory practices, including Good Laboratory Practices (GLP), Good Manufacturing Practices (GMP), and International Council for Harmonisation (ICH). |
| **Learning Outcomes** | *Upon successful completion, learners will be able to:*<br><br>1. Understand the theoretical principles behind classical and instrumental analytical methods used in pharmaceutical analysis.<br>2. Develop skills in performing qualitative and quantitative analysis of pharmaceutical substances.<br>3. Capacity to apply classical and instrumental analytical methods in laboratory settings.<br>4. Gain knowledge regarding the application of modern technology, focusing on their validation and quality control.<br>5. Understand the role of analytical chemistry in drug development and quality control. |

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| | 6. Acquire knowledge of GLP, GMP) and ICH systems in pharmaceutical analysis. |
| | 7. Learn the importance of meeting quality specifications, including identification, purity, and dosage, in pharmaceutical analysis. |
| | 8. Understand the role of pharmacopeial monographs and reference substances in ensuring quality and compliance in pharmaceutical analysis. |
| **Indicative Syllabus (Theory)** | • Introduction to analytical chemistry: key concepts, role and importance. |
| | • Errors in analytical chemistry: types of errors, impact of errors on data accuracy and precision and methods to minimise errors in laboratory practices. |
| | • Quality control of pharmaceuticals. |
| | • Laboratory accreditation and certification: GMP, GLP, and ICH. |
| | • Principles and techniques for calibration of analytical instruments. |
| | • Methods of sample collection and preparation for analysis. |
| | • Method validation: principles of method validation in analytical chemistry, Criteria for validating analytical methods, Regulatory requirements. |
| | • Volumetric methods: Theory and application of volumetric analysis. |
| | • Gravimetric methods: Theory and applications of gravimetric analysis. |
| | • Electrochemical methods: Principles of potentiometry, voltammetry, and other electrochemical methods. |
| | • Spectroscopic techniques: ultraviolet-visible spectroscopy (UV-Vis), infrared spectroscopy (IR), nuclear magnetic resonance spectroscopy (NMR), atomic absorption spectroscopy (AAS), and emission spectroscopy (ES). |
| | • Introduction to and application of capillary electrophoresis. |
| | • Principles of chromatography and its use in pharmaceutical analysis: high performance liquid chromatography (HPLC) and ultra performance liquid chromatography (UPLC). |

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| | • Sample preparation techniques. |
| **Indicative Syllabus (Laboratory)** | • Learn and use different methods to identify and determine the quantity of pharmaceutical substances |
| | • Perform titrations to determine the concentration of a substance in a sample. |
| | • Prepare and use standard solutions for volumetric analysis. |
| | • Application of acid-base, redox, and precipitation titrations in pharmaceutical analysis. |
| | • Performing direct potentiometry to measure the potential difference in a sample. |
| | • Conducting potentiometric titrations for determining the concentration of certain substances in pharmaceutical samples. |

### 1.3.9    Business and Administration

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| **Overview** | This component is included in full at EQF Level 4. No additional content is specified for EQF Level 6. |
| | ^*The following discipline overview are derived from an EQF Level 6 programme currently offered in Ireland. In the Irish context, EQF Level 6 represents an upskilling or advanced education route for pharmacy technicians, providing enhanced professional competencies beyond the baseline qualification required for practice.* |
| | ^*The aim of this discipline (Pharmacy Purchasing and Sales) is to provide students with a comprehensive overview of every aspect of the procurement, storage, distribution and sale of medicines in both community and hospital pharmacy.* |
| **Learning Outcomes** | As all intended learning outcomes for this component are addressed at EQF Level 4, no separate outcomes are included at this level. |
| | ^*The following discipline learning outcomes are derived from an EQF Level 6 programme currently offered in Ireland. In the Irish context, EQF Level 6 represents an upskilling or advanced training route for pharmacy technicians, providing enhanced professional competencies beyond the baseline qualification required for practice.* |

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| | ^*Pharmacy Purchasing and Sales* <br><br> • *Develop and implement effective purchasing and inventory control systems in community and hospital pharmacy.* <br><br> • *Manage challenges arising from pharmaceutical supply chain issues.* <br><br> • *Integrate patient safety considerations in the procurement, storage and distribution of medicinal products.* <br><br> • *Evaluate the effectiveness of merchandising and sales strategies utilised within a commercial retail pharmacy business.* |
| **Indicative Syllabus (Theory)** | There is no further expansion of the syllabus at EQF Level 5, as the full scope of training for this component is covered at EQF Level 4. |
| **Indicative Syllabus (Laboratory)** | N/A |

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| **1.3.10   Professional Development** |

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| **Overview** | This component is included in full at EQF Level 4. No additional content is specified for EQF Level 6. <br><br> ^***The following discipline overview is derived from an EQF Level 6 programme currently offered in Ireland. In the Irish context, EQF Level 6 represents an upskilling or advanced training route for pharmacy technicians, providing enhanced professional competencies beyond the baseline qualification required for practice.*** <br><br> ^*The aim of this discipline (Clinical Governance and Ethics) is to enable students to gain an understanding of the principles of clinical governance and ethics in pharmacy practice. Particular emphasis will be placed upon the requirements of ensuring improved quality of service and safeguarding high standards of patient safety and ethics in decision-making, whilst maintaining excellence in clinical care. The student should be able to understand the role of the health professional in relation to decision-making processes, from a legal and ethical perspective.* |

| Learning Outcomes | As all intended learning outcomes for this component are addressed at EQF Level 4, no separate outcomes are included at this level. |
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| | ^***The following discipline learning outcomes are derived from an EQF Level 6 programme currently offered in Ireland. In the Irish context, EQF Level 6 represents an upskilling or advanced training route for pharmacy technicians, providing enhanced professional competencies beyond the baseline qualification required for practice.**_ |
| | ^*Clinical Governance and Ethics* |
| | • *Demonstrate an ability to ensure safe and effective clinical care to a high standard that meets the needs of patients, while also improving patient experiences.* |
| | • *Demonstrate an understanding of the legal and ethical obligations in relation to patient records, and specific patient interviews, including knowledge of systems of cataloguing and recording, retrieval and archiving of patient records.* |
| | • *Illustrate a descriptive understanding of the processes for quality improvement in patient and public involvement, clinical audit, risk management, staffing and staff management, education training and personal development.* |
| | • *Critically analyse and debate the legal obligations and associated ethical dilemmas of pharmacy technicians in the clinical setting in line with the Pharmaceutical Society of Ireland's code of conduct for pharmacists.* |
| Indicative Syllabus (Theory) | There is no further expansion of the syllabus at EQF Level 5, as the full scope of training for this component is covered at EQF Level 4. |
| Indicative Syllabus (Laboratory) | N/A |

### 1.3.11  Occupational Safety and Health Management (Non-Core)

*(This component is included in some national or institutional programmes, depending on local requirements)*

| Overview | This component is included in full at EQF Level 4. No additional content is specified for EQF Level 6. |
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| Learning Outcomes | As all intended learning outcomes for this component are addressed at EQF Level 4, no separate outcomes are included at this level. |
| Indicative Syllabus (Theory) | There is no further expansion of the syllabus at EQF Level 5, as the full scope of training for this component is covered at EQF Level 4. |
| Indicative Syllabus (Laboratory) | N/A |

### 1.3.12 Sustainability (Non-Core)

*(This component is included in some national or institutional programmes, depending on local requirements)*

| Overview | This component is included in full at EQF Level 4. No additional content is specified for EQF Level 6. |
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| Learning Outcomes | As all intended learning outcomes for this component are addressed at EQF Level 4, no separate outcomes are included at this level. |
| Indicative Syllabus (Theory) | There is no further expansion of the syllabus at EQF Level 5, as the full scope of training for this component is covered at EQF Level 4. |
| Indicative Syllabus (Laboratory) | N/A |

### 1.3.13 Nutrition and Health

| Overview | This component is included in full at EQF Level 5. No additional content is specified for EQF Level 6. |
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| Learning Outcomes | There is no further expansion of the syllabus at EQF Level 5, as the full scope of training for this component is covered at EQF Level 4. |
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| Indicative Syllabus (Theory) | There is no further expansion of the syllabus at EQF Level 6, as the full scope of training for this component is covered at EQF Level 5. |
| Indicative Syllabus (Laboratory) | N/A |

### 1.3.14   Biochemistry

| Overview | The component focuses on a comprehensive understanding of the structural and functional aspects of biomacromolecules within the cell. This course emphasises the relationship between molecular structure and function, the main biochemical reactions, key metabolic pathways, and bioenergetics. |
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| Learning Outcomes | *Upon successful completion, learners will be able to:*<br><br>1. Ability to search, analyse, and critically evaluate scientific articles and research papers relevant to biochemistry.<br><br>2. Acquire a comprehensive understanding of the structure and function of biomacromolecules, such as proteins, lipids, nucleic acids, and carbohydrates, and their roles in cellular functions and overall organismal health.<br><br>3. Understand the enzyme regulation and its critical role in maintaining cellular homeostasis.<br><br>4. Comprehend the metabolic pathways, metabolic diseases and related biochemical processes.<br><br>5. Understand biochemical concepts, metabolic pathways, and enzyme functions.<br><br>6. Develop research, presentation and discussion skills. |
| Indicative Syllabus (Theory) | • Structure and function of proteins, lipids, carbohydrates, and nucleic acids<br><br>• Importance of molecular structure in biological functions |

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| | • Metabolic pathways and bioenergetics: glycolysis, citric acid cycle, oxidative phosphorylation, and energy storage<br><br>• Biochemical reactions and enzyme regulation: enzyme catalysis, kinetics, and regulation mechanisms<br><br>• Metabolic disorders: biochemical basis and potential treatments |
| **Indicative Syllabus (Laboratory)** | N/A |

## 1.3.15  Genetics

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| **Overview** | Explores human genetics, covering hereditary diseases, chromosomal syndromes, gene-environment interactions, and genetic testing. Learners will learn about DNA structure, gene regulation, mutations, oncogenetics, and gene therapy while developing skills in bibliographic research and critical analysis of scientific literature. Ethical considerations in genetic counselling are also addressed. |
| **Learning Outcomes** | *Upon successful completion, learners will be able to:*<br><br>1. Understand the hereditary nature of diseases and inheritance patterns.<br><br>2. Identify common chromosomal syndromes, congenital malformations, and hereditary disorders.<br><br>3. Comprehend gene-drug and gene-diet interactions.<br><br>4. Interpret genetic tests and recognise their limitations.<br><br>5. Develop critical analysis skills for scientific literature in genetics.<br><br>6. Apply genetic principles to understand biological processes and trait inheritance.<br><br>7. Utilise molecular study methods to analyse the genome and genetic mutations.<br><br>8. Grasp the fundamentals of pharmacogenetics and pharmacogenomics. |
| **Indicative Syllabus (Theory)** | • Introduction to genetics: inheritance and patterns, structure of DNA and its information capacity, genes and the nuclear and mitochondrial genomes |

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| | • Molecular bases of genetics: DNA replication, transcription, and translation processes, Regulation of gene expression<br><br>• Genetic diversity and mutations<br><br>• Applications of molecular genetics methods in medical research<br><br>• Pharmacogenetics and pharmacogenomics: drug metabolism and response, role of pharmacogenomics in personalised medicine, introduction to gene therapy<br><br>• Genes in oncology: role of genes in the development of cancer, Understanding genetic mutations in oncogenesis<br><br>• Ethical considerations in genetics. |
| **Indicative Syllabus (Laboratory)** | N/A |

### 1.3.16 Immunology

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| **Overview** | This component provides a comprehensive understanding of the immune system, covering both innate and acquired immunity. Learners will learn about immune cells, soluble mediators, and the stages of immune responses, including antigen processing, presentation, and cellular migration. Content addresses immunopathologies like autoimmune diseases, immunodeficiencies, and allergies, as well as key definitions like lymphopoiesis, lymphoid organs, immune response mechanisms, and the regulation of immune functions. By the end of the training, learners will be able to analyse immune system alterations and interpret laboratory results in both normal and pathological contexts. |
| **Learning Outcomes** | *Upon successful completion, learners will be able to:*<br><br>1. Understand innate and acquired immunity, immune cells, and soluble mediators of inflammation.<br><br>2. Recognise the stages of immune responses, antigen processing, and presentation. |

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| | 3. Identify changes in immune parameters (cellular or humoral) and interpret them in immunopathological contexts. |
| | 4. Understand lymphopoiesis, primary and secondary lymphoid organs, and cellular migration. |
| | 5. Comprehend the mechanisms of immune response and its regulation. |
| | 6. Analyse and interpret laboratory results from immune system studies, distinguishing between normal and pathological conditions. |
| | 7. Develop critical thinking and expand their knowledge in immunology, applying laboratory methodologies to study immune system functions and diseases. |
| **Indicative Syllabus (Theory)** | • Immune system overview: innate and acquired immunity, immune cells, and soluble mediators of inflammation<br><br>• Lymphoid system: lymphopoiesis, primary and secondary lymphoid organs, and cellular migration<br><br>• Immune response and antigen processing: antigen recognition, processing, presentation, and antigen-antibody interactions<br><br>• Effector mechanisms and regulation: complement activation, cytotoxicity, cytokines, and regulation of the immune response<br><br>• Immunopathologies and laboratory studies: autoimmune diseases, immunodeficiencies, allergies, and laboratory techniques for immune system analysis |
| **Indicative Syllabus (Laboratory)** | N/A |
| **1.3.17 Biotechnology** | |
| **Overview** | This component provides an in-depth understanding of the principles and applications of molecular biotechnology and bioprocesses in the development of bio-pharmaceuticals. The course covers the production of recombinant proteins, therapeutic proteins, vaccines, gene therapy, cellular therapy, and tissue engineering. |

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| **Learning Outcomes** | *Upon successful completion, learners will be able to:* <br><br> 1. Integrate and apply the knowledge acquired in emerging areas of molecular biotechnology and biotechnological processes, particularly in the context of bio-pharmaceuticals applied to human health. <br><br> 2. Be capable of proposing methodologies for the production of bio-pharmaceuticals and designing new therapeutic strategies based on a multidisciplinary and complex approach, combining problem-solving skills. <br><br> 3. Through group dynamics to collaboratively solve proposed challenges, learners will develop scientific and technological reasoning, as well as oral and written communication skills, using appropriate terminology, thereby enhancing collaboration and critical thinking abilities. |
| **Indicative Syllabus (Theory)** | • Introduction to molecular biotechnology and bioprocesses: concepts of molecular biotechnology and bioprocesses, distinction between bio-pharmaceuticals and conventional pharmaceuticals. <br><br> • Production of bio-pharmaceuticals: recombinant protein production, prokaryotic/eukaryotic heterologous expression systems, protein engineering, directed and combinatorial mutagenesis. production of blood factors, hormones, growth factors, cytokines, enzymes, monoclonal antibodies. <br><br> • Vaccine production: attenuated/inactivated vaccines. purified proteins/polysaccharides. recombinant proteins/nucleic acids. <br><br> • Gene therapy: viral/non-viral vectors. gene introduction/substitution and expression modulation. gene repair. <br><br> • Biomaterials: definition, types and applications in biotechnology and medicine. |
| **Indicative Syllabus (Laboratory)** | N/A |

### 1.3.18 Pharmacoepidemiology

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| **Overview** | This component focuses on studying medication use and its effects at the population level. It covers fundamental principles, epidemiological indicators, and study designs (observational and experimental). Learners will explore real-world applications such as medication utilisation studies, self-medication, adherence, polypharmacy, and |

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| | benefit-risk assessment. The component addresses biases, confounding factors, and the role of real-world evidence in evaluating drug safety and effectiveness. |
| **Learning Outcomes** | *Upon successful completion, learners will be able to:*<br><br>1. Develop reasoning skills in pharmacoepidemiology to analyse medication use patterns.<br><br>2. Understand the methodologies for planning, conducting, and evaluating drug utilisation studies to promote rational drug use.<br><br>3. Gain expertise in data collection, processing, and analysis for non-experimental and experimental studies, including drug utilisation research, cohort studies, case-control studies, cross-sectional studies, and clinical trials.<br><br>4. Apply principles of general and clinical epidemiology, as well as pharmacology, to assess medication use and its effects. |
| **Indicative Syllabus (Theory)** | • Fundamentals of pharmacoepidemiology: definition and key concepts in pharmacoepidemiological studies, epidemiological indicators, study design in pharmacoepidemiology.<br><br>• Study designs: observational studies (cross-sectional, case-control, and cohort studies), experimental studies and clinical trials.<br><br>• Bias and confounding factors in epidemiological research.<br><br>• Drug utilisation studies: case studies in self-medication, medication errors, adherence, and polypharmacy, benefit-risk assessment, real-world evidence in pharmacoepidemiology. |
| **Indicative Syllabus (Laboratory)** | N/A |
| **1.3.19 Pharmacognosy** | |

| Overview | This component focuses on the study of medicinal plants and raw materials of natural origin. It explores the phytochemical constituents, pharmacological effects, and toxicological aspects of various bioactive compounds. Learners will gain practical knowledge of extraction techniques and qualitative/quantitative analysis methods. |
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| Learning Outcomes | *Upon successful completion, learners will be able to:* <br><br> 1. Identify the main groups of drugs of natural origin and the corresponding medicinal plants. <br><br> 2. Characterise the methodologies used for the extraction and quantitative and qualitative analysis of bioactive compounds from medicinal plants. <br><br> 3. Understand the natural raw materials most commonly used in pharmacy and their respective analysis methodologies. <br><br> 4. Develop laboratory skills in the field of pharmacognosy and comprehend its multidisciplinary aspects in the phytochemical and pharmacological domains. |
| Indicative Syllabus (Theory) | • Overview of the relationship between pharmacognosy and other scientific disciplines (e.g., chemistry, pharmacology, toxicology). <br><br> • Phytochemical determinants, pharmacological and toxicological effects of medicinal plants and/or raw materials based on phytochemical components: <br>     o Monosaccharides, polyols, and polyuronic acids. <br>     o Lipids. <br>     o Aromatic compounds. <br>     o Alkaloids. <br>     o Anthraquinone glycosides. <br>     o Cardiotonic glycosides. <br>     o Saponins. <br>     o Polyphenolic compounds. |

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| | • Methods of extraction and qualitative/quantitative analysis of active compounds: <br><br>   o Determination of reducing sugars. <br><br>   o Determination of acidity, peroxide, iodine, and saponification indices. <br><br>   o General reagents for alkaloids. <br><br>   o Bornträger's reaction. <br><br>   o Specific reactions for cardiotonic glycosides. <br><br>   o Determination of total phenolic content and antioxidant activity. <br><br> • Applications of phytochemicals in pharmaceutical sciences: therapeutic use of natural compounds, pharmacological properties and toxicological aspects of bioactive plant compounds. |
| **Indicative Syllabus (Laboratory)** | • Extraction techniques: solvent extraction, steam distillation, cold pressing. <br><br> • Identification & characterisation: thin-layer chromatography, high-performance liquid chromatography, spectroscopy (UV-Vis, IR, NMR, MS). <br><br> • Pharmacological testing: bioassays for pharmacological activity. <br><br> • Toxicological screening: basic safety evaluations. <br><br> • Analysis of alkaloids, saponins, polyphenols, essential oils, and glycosides. <br><br> • Chemical parameter determination: acidity, peroxide, and phenolic content. <br><br> • Lab-report writing experimental documentation and results interpretation. |
| **1.3.20   Veterinary Pharmacy** | |
| **Overview** | This component provides learners with comprehensive knowledge of veterinary pharmacology, pharmacokinetics, and pharmacodynamics across different animal species, along with the legal and regulatory framework governing veterinary medicines. Learners will explore infectious diseases, understanding preventive measures and their |

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| | implications for both animal and public health, and dermatological conditions, including dermatitis and dermatoses. The component also introduces complementary approaches in veterinary care, such as compounded medications, supplements, hygiene products, and cosmetics. |
| **Learning Outcomes** | *Upon successful completion, learners will be able to:* <br><br> 1. Develop a deep understanding of veterinary pharmacy, with a particular emphasis on its relevance in community pharmacy settings. <br><br> 2. Identify the risks associated with the use of medications in animals, both in terms of safety for the animals and potential impacts on food security. <br><br> 3. Understand zoonoses, infectious diseases and dermatological conditions. <br><br> 4. Comprehend pharmacotherapy and the ability to counsel companion animals. |
| **Indicative Syllabus (Theory)** | • Pharmacokinetics and pharmacodynamics of species <br><br> • Legislation and regulation regarding veterinary pharmacology <br><br> • Zoonoses and emerging diseases: main infectious and parasitic and prophylactic measures <br><br> • Veterinary pharmacovigilance and major risks of medications in animals <br><br> • Major poisonings in companion animals: toxic foods and compounds with high toxicity in animals <br><br> • Antimicrobials in veterinary medicine <br><br> • Ectoparasites and Endoparasites: external and internal antiparasitics <br><br> • Dermatitis and dermatoses <br><br> • Complementary approaches in veterinary medicine: supplements, hygiene products, cosmetics <br><br> • Pharmacotherapy and counselling in companion animals |
| **Indicative Syllabus (Laboratory)** | N/A |

| 1.3.21 Nuclear Pharmacy | |
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| **Overview** | This component provides learners with a solid understanding of radiopharmacy and nuclear pharmacy, focusing on the principles and clinical applications of radiopharmaceuticals for diagnostic and therapeutic use. Learners will learn about the preparation, quality control, and safety of radiopharmaceuticals, including radioisotope production, chemistry, and regulatory aspects. Key nuclear imaging techniques like PET and scintigraphy will also be explored, along with safe administration practices in clinical settings. |
| **Learning Outcomes** | *Upon successful completion, learners will be able to:*<br><br>1. Equip learners with the necessary skills for the safe and effective preparation, quality control, and administration of radiopharmaceuticals.<br><br>2. Understand the principles of radio-pharmacy, from radioisotope production to clinical applications in both diagnostics and therapy.<br><br>3. Develop a deep understanding of safety standards and regulations related to handling radioactive substances, both in laboratory and clinical settings.<br><br>4. Explore various nuclear imaging modalities and their clinical applications, focusing on using radiopharmaceuticals for diagnostic imaging and treatments. |
| **Indicative Syllabus (Theory)** | • Definition and principles of radiopharmacy.<br><br>• Production of radioisotopes: methods and equipment.<br><br>• Chemistry of radiopharmaceuticals: properties and structure.<br><br>• Preparation and quality control of radiopharmaceuticals.<br><br>• Safety regulations and standards for handling radioactive substances.<br><br>• Monitoring radiation exposure and protecting workers and patients.<br><br>• Quality control and auditing in nuclear pharmacy setting. |

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| | • Use of radiopharmaceuticals in diagnosing cardiovascular diseases, oncology, neurology, and other areas. |
| | • Therapeutic applications of radiopharmaceuticals. |
| **Indicative Syllabus (Laboratory)** | N/A |

### 1.3.22  Health Psychology

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| **Overview** | This component focuses on the psychological factors affecting health, covering four main areas. First, it explores the evolving concept of health, the impact of behaviours, and the psychosocial, emotional, and environmental determinants of health. Second, it examines communication skills in healthcare settings, emphasising effective interaction with patients and health teams. The third part focuses on stress, its impact on health, and strategies for managing stress and burnout. Finally, the component covers emotional regulation, the effects of anxiety and depression, and techniques for self-regulation to promote well-being. This component aims to provide learners with an understanding of the psychological factors that influence health and disease. |
| **Learning Outcomes** | *Upon successful completion, learners will be able to:* <br> 1. Recognise the impact of behaviours on health and well-being. <br> 2. Identify the psychosocial, environmental, emotional, and cognitive determinants of health and disease behaviours. <br> 3. Apply principles of health promotion, health literacy, and education in healthcare settings. <br> 4. Develop effective communication skills for interacting with both patients and healthcare teams. <br> 5. Understand the concept of stress, its effects on health, and key explanatory models. <br> 6. Recognise the relationship between stress, health, and disease, including professional burnout. <br> 7. Utilise coping strategies to manage stress in both personal and professional contexts. <br> 8. Understand emotional regulation and its relevance to health. <br> 9. Identify symptoms of anxiety and depression and their impact on health. |

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| | 10. Apply emotional self-regulation strategies to enhance personal well-being and professional practice. |
| **Indicative Syllabus (Theory)** | • Evolution of the concept of health and its contemporary understanding. <br><br> • The impact of behaviours on health outcomes. <br><br> • Determinants of health and disease behaviours: psychosocial, environmental, emotional, and cognitive factors. <br><br> • The relationship between lifestyle, health, and quality of life. <br><br> • Health promotion, health literacy, and health education strategies. <br><br> • Communication at different levels: patient interaction and teamwork in healthcare. <br><br> • Understanding stress and the impact of stress on health and disease. <br><br> • Stress in the professional context: Burnout and its effects. <br><br> • Strategies to manage and cope with stress in personal and professional life. <br><br> • Anxiety and depression: recognising symptoms and impact. <br><br> • Techniques for emotional self-regulation and promoting well-being. |
| **Indicative Syllabus (Laboratory)** | N/A |
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| **1.3.23  Drug Development & Regulatory Affairs** | |
| **Overview** | This component focuses on the drug development process, focusing on both pre-clinical and clinical stages, while exploring the regulatory frameworks. Ethical considerations in pre-clinical and clinical research, the legal and regulatory frameworks governing clinical trials, and the processes involved in obtaining regulatory approval for medicines. The component covers the design and conception of clinical studies, common study designs, the principles of drug regulation, and the role of regulatory authorities. Learners will also learn about the regulatory systems in Europe, the market authorisation process, and intellectual property, particularly patents. |

| Learning Outcomes | *Upon successful completion, learners will be able to:* |
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| | 1. Drug development: Pre-clinical and clinical stages of drug development, Regulatory frameworks. |
| | 2. Identify ethical issues: Identify and understand key ethical considerations related to research. |
| | 3. Understand legal and regulatory frameworks of clinical research. |
| | 4. Ability to describe and understand clinical study design concepts. |
| | 5. Comprehend the principles of drug regulation, the role of regulatory authorities, and the regulatory systems in Europe. |
| | 6. Understand the process of drug registration and market authorisation processes. |
| | 7. Develop basic intellectual property skills: Patent regulation and content. |
| **Indicative Syllabus (Theory)** | • Pre-clinical development<br>○ Overview of the drug development process.<br>○ Pre-clinical evaluation.<br>○ Types of experimental designs.<br>○ *In silico, in vitro,* and *in vivo* testing.<br>○ Cellular models.<br>○ Animal experimentation and ethical considerations.<br><br>• Clinical research<br>○ General concepts of clinical trials<br>○ Regulatory, ethical framework, and types of clinical trial<br>○ Primary and secondary endpoints; surrogate endpoints<br>○ Phases of clinical trials |

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| | o Non-inferiority, equivalence, and superiority studies<br><br>o Clinical trial protocol and registration<br><br>o Informed consent<br><br>o Clinical trial monitoring<br><br>• Regulatory affairs<br><br>o Regulatory framework in Portugal and Europe<br><br>o Types of AIMs and common technical document<br><br>o Centralised, decentralised, mutual recognition, and national procedures<br><br>o European and ICH guidelines<br><br>• Patent regulation and content |
| **Indicative Syllabus (Laboratory)** | N/A |

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| **1.3.24 Pharmacovigilance** | |
| **Overview** | This component provides learners with a comprehensive understanding of pharmacovigilance, focusing on the principles, methodologies, and clinical aspects of drug safety monitoring. It covers the essential concepts of pharmacovigilance, including the definition and classification of adverse drug reactions, methods for detecting and evaluating safety signals, and the systems in place for monitoring drug safety at national and international levels. Learners will learn about spontaneous ADR reporting, epidemiological methods applied to pharmacovigilance, and causal assessment techniques. Additionally, learners will gain insights into pharmacovigilance practices within clinical trials, including preclinical safety assessments and regulatory requirements under European pharmacovigilance laws. |
| **Learning Outcomes** | *Upon successful completion, learners will be able to:* |

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| | 1. Equip learners with the skills and competencies needed to assess the safety of medicines throughout their entire lifecycle. |
| | 2. Understand the principles of pharmacovigilance, from the development of the science to its role in both pre-authorisation and post-authorisation stages, as well as the roles of stakeholders involved in pharmacovigilance. |
| | 3. Gain and deepen knowledge while developing attitudes and behaviours that enable learners to participate effectively and responsibly in the monitoring of adverse effects associated with drug use and report them to the National Pharmacovigilance System. |
| | 4. Identify, characterise, and assess adverse drug reactions effectively. |
| | 5. Equip learners with a comprehensive understanding of European pharmacovigilance regulations and guidelines. |
| **Indicative Syllabus (Theory)** | • Fundamentals of Pharmacovigilance: Basic concepts, National Pharmacovigilance System, Pharmacovigilance in Europe and worldwide (EMA and WHO), Spontaneous reporting.<br><br>• Adverse drug reactions (ADRs): concepts and definitions, classification, signal detection methods, epidemiological methods in pharmacovigilance and data sources, causality assessment (Naranjo algorithm, WHO classification).<br><br>• ADRs affecting cardiovascular, gastrointestinal, CNS, respiratory, and ocular systems.<br><br>• Drug allergies and hypersensitivity reactions.<br><br>• Medication safety in pregnancy and lactation.<br><br>• Vaccine safety.<br><br>• Pharmacovigilance in clinical trials: safety evaluation of medicines, preclinical safety assessment, European pharmacovigilance regulation. |
| **Indicative Syllabus (Laboratory)** | N/A |

| 1.3.25   Physics | |
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| **Overview** | This component focuses on providing learners a solid foundation in fundamental and applied physics concepts necessary for the pharmacy field. Emphasis will be placed on fluid mechanics, molecular and ionic diffusion phenomena, spectroscopy, and optics, in order to understand the physics of biological media and instrumental methods in Pharmacy. |
| **Learning Outcomes** | *Upon successful completion, learners will be able to:* <br><br> 1. Understand and apply fundamental physics concepts related to the study of biological media and instrumental methods used in Pharmacy, particularly in fluid mechanics, diffusion phenomena, and spectroscopy. |
| **Indicative Syllabus (Theory)** | • Introduction to mechanics: units, unit conversion, and physical quantity dimensions, kinematics, newton's laws of motion fluid mechanics: hydrostatics, hydrodynamics (non-viscous flow), viscous flow, surface phenomena. <br><br> • Molecular and ionic diffusion. <br><br> • Elements of atomic and molecular spectroscopy: electromagnetic radiation, interaction of electromagnetic radiation with matter, atomic and molecular spectroscopy. |
| **Indicative Syllabus (Laboratory)** | N/A |
| 1.3.26   Pharmacy Research | |
| **Overview** | This component focuses on the key principles and methodologies of scientific research, with an emphasis on investigation techniques, data collection, and statistical analysis. Learners will explore the scientific method, critical analysis of research papers, and pharmacoepidemiology studies. The component also covers the ethical considerations in research and guides learners through the process of conducting their own research projects, |

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| | including data collection, analysis, and the writing of scientific papers. Learners will develop the skills necessary to critically evaluate scientific literature, apply research methodologies, and present their findings effectively.<br><br>^*The following discipline overview is derived from an EQF Level 6 programme currently offered in Ireland. In the Irish context, EQF Level 6 represents an upskilling or advanced education route for pharmacy technicians, providing enhanced professional competencies beyond the baseline qualification required for practice.*<br><br>^The aim of this discipline (Pharmacy Dissertation) is to provide pharmacy technician students with the opportunity to develop research skills pertinent to working on a pharmacy practice research team. Pharmacy technicians may apply the acquired skills to their role in the provision of quality and up-to-date pharmacy/pharmacist support by implementing evidence-based best practice. They should be in a position to deliver on the collection and reporting of quality research data necessary for the ongoing improvement of the service. Additionally, this component will prepare pharmacy technician students for advanced studies, should they wish to pursue further education at undergraduate or postgraduate level. |
| **Learning Outcomes** | *Upon successful completion, learners will be able to:*<br><br>1. Apply and develop research methodologies.<br>2. Design and implement data collection methodologies.<br>3. Apply various statistical tests to analyse collected data.<br>4. Interpret the results and conclusions of scientific articles.<br>5. Conduct and present a scientific paper.<br><br>^*The following discipline learning outcomes are derived from an EQF Level 6 programme currently offered in Ireland. In the Irish context, EQF Level 6 represents an upskilling or advanced education route for pharmacy technicians, providing enhanced professional competencies beyond the baseline qualification required for practice.*<br><br>^*Pharmacy Dissertation*<br><br>• *Skilfully search databases to obtain peer-reviewed, academic research literature and reviews* |

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| | • *Appraise different sources of peer-reviewed / academic research literature. Perceive ethical issues and circumstances demanding integrity* |
| | • *Critically review evidence-based research relevant to pharmacy practice* |
| | • *Demonstrate an appreciation of research critiquing techniques* |
| | • *Communicate literature review research findings to peers in a performance evaluation semi-structured seminar* |
| **Indicative Syllabus (Theory)** | • Critical analysis of research papers<br>• Systematic review<br>• Epidemiological studies: levels of evidence in scientific literature, classification, and scientific credibility<br>• Pharmacoepidemiology: studies on medication utilisation<br>• Ethical principles in research |
| **Indicative Syllabus (Laboratory)** | • Research project implementation: data collection and processing, discussion and conclusions.<br>• Writing a scientific paper.<br>• Presentation and discussion of research articles. |

### 1.4 Work Placement

Although the academic profile of pharmacy technicians varies across European countries, the underlying generic competency framework is largely consistent. Differences in academic preparation influence professional autonomy and the scope of competencies that pharmacy technicians can perform. These competencies may be further developed and enhanced through lifelong learning.

This section outlines the competencies expected of pharmacy technician students during curricular internships/placements, integrating core competency domains with specific practical activities in both hospital pharmacy and community pharmacy settings.

Placements may be completed in a single period (e.g., during the final year) or distributed over several years. During the placement, students work under the direct supervision of a qualified professional (pharmacist or senior pharmacy technician). Independent professional decision-making is not permitted without supervision.

An overview of the work placement, including learning outcomes and general structure, is summarised in Table 6. However, the extract structure, duration, and organisation of placements vary across participating countries. Table 7 presents a comparative overview of placement frameworks for pharmacy technician education in Spain, Belgium, Ireland, and Portugal, highlighting differences in duration, credit weighting, year of study, and placement settings.

*Table 6. Work Placement in Pharmacy Technician Training/Education: Overview, Learning Outcomes and Structures*

| Overview | This component involves a period of planned work placement in either a hospital or community pharmacy. The component has the following aims: <br><br> 1. To expose students to the organisation and management of a pharmacy. <br><br> 2. To provide students with an opportunity to apply, in a professional setting, the skills, understanding and concepts studied in the Programme curriculum. These include: <br>   o  preparation of a range of medicines extemporaneously under supervision. <br>   o  supply of non-prescription medicines under supervision and in accordance with legislation and guidelines. <br>   o  interpret prescriptions safely and effectively, prepare prescriptions with appropriate packaging, labels, and record patient medical history, such that all is ready for review by the supervisor. <br><br> 3. To extend communication skills to interact with pharmacists, patients, pharmacy and healthcare staff. <br><br> 4. To develop knowledge and skill to recognise when to refer a situation to the supervisor. <br><br> 5. To allow students to benefit from the skills/expertise of practicing pharmacists, pharmacy technicians and pharmacy staff. |
|---|---|
| Learning Outcomes | *Upon successful completion of this component, learners will be able to:* <br><br> 1. Demonstrate the professional skills required to obtain a suitable placement and complete it in accordance with a defined code of conduct. <br><br> 2. Demonstrate competence in the extemporaneous preparation of a range of medicines under supervision. <br><br> 3. Demonstrate competence in the supply of non-prescription medicines under supervision, in compliance with legislation and professional guidelines. <br><br> 4. Demonstrate competence in interpreting prescriptions accurately and safely; preparing the associated medicines with appropriate packaging and labelling; and recording patient medical histories, ready for review by the supervisor. |

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| | 5. Demonstrate effective communication skills when interacting with pharmacists, patients, and pharmacy or healthcare staff. |
| | 6. Demonstrate the ability to recognise situations that require referral to the supervisor and reflect on the knowledge and judgement needed to do so appropriately. |
| | 7. Demonstrate an understanding of inventory control, storage requirements, expiry dates management. |
| **Placement Options** | • Hospital Pharmacy |
| | • Community Pharmacy |
| | • Others (research; pharmaceutical distribution companies; private/military/prison healthcare services; regulatory authorities; community health centres; other health-related companies) |
| | *Note: The "Others" category is optional and may vary by country and educational provider. In Ireland, pharmacy technician placements are offered only in hospital and community pharmacies.* |
| **Placement Duration** | • Between 500 and 1000 hrs |

### 1.4.1 Main Tasks in Community Pharmacy

#### 1.4.1.1 *Dispensing & Advice*

- Validate prescriptions according to legislation.
- Dispense prescription medicines and advise patients on their use.
- Prepare the patient-specific medication using the personalised dosage compliance system.
- Provide information and counselling on: OTC medicines, medical devices, dietary supplements, phytotherapy, baby care products, and other pharmacy items.
- Promote responsible medicine and product use.

- Familiarity with the internal error reporting systems and subsequent investigations

### 1.4.1.2    Health Services & Monitoring

- Perform point-of-care tests and measure vital signs/somatometric parameters.
- Participate in health promotion and disease prevention initiatives.
- Offer first aid in case of emergencies when needed.

### 1.4.1.3    Inventory & Documentation

- Collaborate in procurement, reception, storage, and replenishment of medicines, raw materials, equipment, and other pharmacy goods.
- Maintain proper storage conditions, monitor expiry dates and engage in waste management procedures for returned or out of date stock
- Check product condition, storage, and maintenance according to standards.
- Manage administrative and financial procedures: process prescription reimbursements, handle payments, and manage cash transactions.
- Maintain and update pharmacy records and documentation.
- Coordinate with other healthcare providers and institutions when required.

### 1.4.1.4    Pharmacy Compounding

- Check, clean, and verify the proper functioning of compounding equipment and ensure raw materials are available and within expiration dates.
- Preparation of extemporaneous (compounded) medicines consists in the accurate weighing, mixing, and assembling of ingredients in accordance with applicable legislation, SOPs, and labelling requirements, to obtain a pharmaceutical preparation for an individual patient or defined patient group when a suitable commercially available medicinal product is not available or appropriate for use.
- Clean and disinfect the workspace and equipment, follow safety protocols, and ensure proper storage and waste disposal.

### 1.4.2 Main Tasks in Hospital Pharmacy

#### 1.4.2.1 Medication & Distribution Systems

- Participate in all medication distribution systems: unit-dose, traditional distribution, level-stock replenishment, and special systems (e.g. antibiotics, blood products, narcotics).

- Perform ward top-ups and deliver medicines to internal units and external healthcare facilities.

- Identify inconsistencies, interactions, or errors in prescriptions and notify the pharmacist or senior technician.

- Dispense healthcare products (optical, orthopaedic, audiometric).

- Familiarity with the internal error reporting systems and subsequent investigations.

- Participate in dispensing and adhering to protocols in line with special services delivery such as clinical trials, Clozapine clinics & genitourinary medicines. *(Note: this task may vary across countries or institutions (e.g., applicable in Ireland))*.

#### 1.4.2.2 Compounding

- Assist in medication repackaging using appropriate technology.

- Support preparation of non-sterile medicinal products and observe aseptic (sterile) compounding processes.

- Develop aseptic compounding skills while working in ACUs involved in production of IV additions, TPN & cytotoxic medications. *(Note: this task may vary across countries or institutions (e.g., applicable in Ireland and Spain))*.

- Carry out dosing, packaging, and labelling of medicinal products.

#### 1.4.2.3 Inventory & Documentation

- Organise, receive, store, and replenish medicines and materials in line with quality standards.

- Maintain proper storage conditions, monitor expiry dates and engage in waste management procedures for returned or out of date stock.

- Update, classify, and maintain pharmacy service documentation.

- Manage returned/expired stock following safety protocols.

### 1.4.3    Assessment

Assessment is carried out by the work placement supervisors and may include the following components:

- Performance assessments via rubrics

- Written or reflective work, such as logbooks, portfolios, or weekly/monthly reflections

- Additional assessment methods, which may include practical assessments, Objective Structured Clinical Examinations (OSCEs), essays, case studies, and other relevant formats

*Note: Work placement assessment formats may vary across countries or institutions.*

### 1.4.4    Internationalisation

Considering that the profession is recognised in several EU countries, overseas work placements may be possible. However, their availability and structure depend on the local guidelines and the arrangements of individual institutions within each country.

*Table 7. Comparison of Work Placement Structures Across Participating Countries.*

| | Spain | Belgium | Ireland | Portugal |
|---|---|---|---|---|
| **Placement options** | **Common**: community or hospital pharmacy<br>**Less common**: pharmaceutical distribution companies, community health centre, and other health-related organisation | Community and hospital pharmacy | Community or hospital pharmacy<br><br>[†]Community pharmacy only | **Mandatory**: community and hospital pharmacy<br>**Optional**: research, distribution, private/military/prison health settings and regulatory agencies |
| **Placement duration** | 500 or 700 hrs (out of a total 2000-hour programme) | [~]A minimum of 700 hrs of practice, including at least 150 hours in both Community and hospital pharmacy | Approximately 600 - 800 hrs<br><br>[†]20 hrs/week for the duration of the course | 800 - 1000 hrs total |
| **Weighting within the course** | 500/700 of 2000 total hrs | Organised by hours (minimum 700 hrs) | 25–40 ECTS, completed either in one block or divided across two years. | One full academic year (60 ECTS), completed either in a single year or divided across years |
| **Student year group** | [#]1st year: 70–180 hrs<br>2nd year: remainder of required hrs. | [*]Variable | [*]Variable<br><br>[†]Workplace based for duration of course | Primarily undertaken in the final year |
| **International placement options** | Yes | Yes | Yes<br><br>[†]No | Yes |
| **Access Requirements** | Evaluation of occupational risk knowledge required for each student. | N/A | Garda vetting is required for hospital pharmacy setting | N/A |

[~] New structure from Sept 2028
[†] IPU long-distance learning pharmacy technician course
[#] 1st year: 70–180 hrs and not earlier than the second semester.
[*] Most programmes include placements in both year-one and year-two, while some offer placements exclusively in the final semester of year-two.

**Chapter 2 – Comparative Roles and Responsibilities of Pharmacy Technicians**

Pharmacy technicians play a vital role in the safe and effective delivery of medicines and healthcare services. However, their specific duties, levels of autonomy, and scope of practice differ significantly across European countries. Chapter 2 provides a structured overview of roles and responsibilities, mapped to EQF levels to show how expectations evolve as education and competence increase.

At EQF Level 4 and above, technicians focus on foundational tasks such as dispensing, stock management, and basic patient counselling. At EQF Level 5 and above, responsibilities expand to include medicines optimisation, QA, and more complex patient-facing activities. At EQF Level 6, technicians may take on leadership roles, specialised technical functions, and contribute to clinical decision-making.

The chapter distinguishes between community pharmacy and hospital pharmacy contexts, acknowledging that while many skills are transferable, certain tasks, such as aseptic compounding or ward-based medicines management, are specific to hospital settings. By clearly articulating these roles, this framework supports:

- Transparency for employers and regulators;

- Consistency in professional expectations;

- Improved workforce planning;

- Progression pathway development for technicians seeking to advance their careers.

**2.1    EQF Level 4 and Above**

At this level, the qualifications from all participating countries (Spain, Belgium, Ireland, and Portugal) aim to establish a solid foundation of essential pharmacy practice competencies. Pharmacy technicians at this stage are expected to contribute effectively in both community and hospital pharmacy settings, ensuring the safe and effective use of medications while supporting pharmacists and other healthcare professionals. Their responsibilities include medication dispensing, patient counselling, basic compounding, stock management, and assisting in clinical and administrative tasks. Table 8 summarises the professional roles and responsibilities that are common across these four countries, highlighting the core tasks and duties that underpin safe, competent, and consistent pharmacy practice at this qualification level.

*Table 8. Roles and Responsibilities of Pharmacy Technician (Common to EQF Levels 4–6).*

**2.1.1    Community Pharmacy**

*2.1.1.1    Medication Dispensing*

- Verify prescriptions for validity and legislative compliance.
- Provide dosage instructions and safety information.
- Identify errors or incompatibilities and report to the pharmacist.
- Report suspected adverse drug reactions or medication errors to the national medicine regulatory authority.
- Inform and select and counsel OTC drugs according to the patients' needs.
- Support awareness programmes related to medication adherence and the rational use of medicines and medical devices (Health Literacy Promotion).

*2.1.1.2    Medication Management*

- Support patients with medication therapy management.
- Support patients with medication adherence.

*2.1.1.3    Customer Service and* **Product** *Sales*

- Answer queries about hygiene/nutrition/cosmetic products.
- Recommend suitable OTC or wellness products based on customer needs.
- Refer complex medication-related questions to the pharmacist.
- Assist with the visual merchandising tasks of the pharmacy.
- Assist in patient-point of care monitoring and measurement, e.g., blood pressure, of blood sugar, weight, height, and lifestyle advice.
- Support medication disposal and environmental safety initiatives.

*2.1.1.4    Dosage Compliance Systems (DCS/MDS)*

- Gather prescribed medications for compliance packs.
- Ensure correct strength, formulation, and dosage timing.
- Label with patient details and instructions.
-  Use of automated machines or through manual preparation for blister packaging.

### 2.1.1.5    Non-sterile compounding

- Comply with hygiene and safety regulations.
- Collaborate with the pharmacist in compounding.
- Calculate ingredient quantities and perform accurate measurements.
- Select appropriate active ingredients and excipients.
- Document compounding activities according to regulations.
- Maintain compounding equipment and workspaces.

### 2.1.1.6    Stock Management

- Ensure proper storage conditions (temperature, humidity, etc.).
- Monitor expiration dates and remove expired products.
- Record product entries/exits.
- Conduct periodic inventories and record product entries/exits.
- Place, receive and review supplier orders.
- Manage stock errors and product returns.
- Organise shelves and storage areas.
- Manage waste collection and returned drugs, biohazardous drugs and others.

### 2.1.1.7    Vaccine Handling

- Receive and store vaccines under appropriate temperature and safety conditions.
- Manage stock levels and record entries/exits to ensure availability and traceability.
- Support pharmacists in vaccine preparation and dispensing according to protocols.

### 2.1.1.8    Quality Management

- Understand and comply with full drug traceability.

### 2.1.1.9    Primary Care Reimbursement Service (PCRS)

- Be familiar with the structure, purpose and national scope of national reimbursement schemes.

### 2.1.2    Hospital Pharmacy

### 2.1.2.1    Medication Dispensing to Wards

- Assist in ordering and supplying non-stock or patient-specific medications to wards and clinical areas.

- Prepare and dispense medication orders for hospital wards.

- Ensure timely and accurate delivery of medications.

- Manage, document, and maintain legally compliant records for controlled/restricted medicines in line with organisational and regulatory requirements.

- Perform technician–technician checking of prescriptions pre-screened by pharmacists, in line with local policy.

- Support dispensary workflow and team coordination under pharmacist supervision.

- Perform team-leading duties within the dispensary, ensuring workflow efficiency and accuracy of medicine preparation under pharmacist supervision.

- Perform technician–technician checking of prescriptions pre-screened by pharmacists, according to organisational policies.

### 2.1.2.2    Outpatient Medication

- Prepare and dispense medications for outpatients and day clinics/hospitals.

- Monitor storage conditions for outpatient medications (temperature, light, expiry).

- Manage patient flow, documentation, and follow-up under pharmacist supervision.

### 2.1.2.3    Unit Dose Preparation

- Split bulk medications into individual patient doses.

- Label doses accurately to prevent administration errors (drug, dosage, expiry).

### 2.1.2.4    Advanced Drug Distribution Systems

- Manage automated dispensing cabinets and barcode medication systems.

- Maintain emergency medication carts

- Maintain robotic systems.

- Pre-package bulk products and assemble emergency medication boxes.

### 2.1.2.5    Non-Sterile Compounding

- Select appropriate active ingredients and excipients.

- Maintain compounding equipment and workspaces.

### 2.1.2.6    Sterile Compounding

- Prepare intravenous admixtures, including antibiotics and TPN.

- Prepare patient-specific hazardous medications following safety protocols.

- Maintain laminar flow hoods and cleanrooms per standards.

- Calculate proper doses and dilutions.

- Compound paediatric formulations requiring precise measurements.

- Comply with hygiene and safety regulations.

- Document compounding activities according to regulations.

- Carry out technician–technician pre- and in-process checking within aseptic compounding units, following established procedures and safety standards.

### 2.1.2.7    Stock Management

- Ensure proper storage conditions (temperature, humidity, etc.).

- Monitor expiration dates and remove expired products.

- Record product entries/exits.

- Conduct periodic inventories and record product entries/exits.

- Place, receive and review supplier orders.

- Manage stock errors and product returns.

- Organise shelves and storage areas.

- Manage waste collection and returned drugs, biohazardous drugs and others.

- Review and maintain ward drug trolleys, presses, and emergency boxes to ensure correct stock levels and expiry control.

### 2.1.2.8    Quality Management

- Comply with and actively support the implementation of Good Pharmacy Practice and Good Compounding Practice standards.

- Contribute to QA activities, including participation in internal reviews and external audits.

- Understand and comply with full drug traceability.

- Support audit and data-collection activities related to hospital medication use and pharmacy service performance.

### 2.1.2.9    Clinical Support & Research

- Take and record accurate medication histories from patients on wards, under the supervision of a pharmacist.

- Prepare, handle, and store investigational medicinal products (IMPs) for clinical trials according to protocol and safety regulations.

- Ensure correct ordering, receipt, recording, dispensing, administration, quarantining, and destruction of IMPs following established procedures.

- Maintain accurate documentation to guarantee full traceability of investigational medicines.

- Identify and report any discrepancies or deviations in IMP handling for prompt correction and QA.

### 2.1.3    Cross-Setting

#### 2.1.3.1    *Training and Education*

- Assist in the training of healthcare professionals, students, and new pharmacy staff, sharing best practice and promoting safe and effective use of medicines.

- Contribute to the design, development, and delivery of educational programmes in pharmacy practice and related scientific areas, under the supervision of academic or senior staff.

- Participate in the preparation of teaching materials, demonstrations, and practical sessions for undergraduate or postgraduate learners.

- Support assessment activities, including the preparation and marking of practical tasks, competency checklists, or other formative evaluations.

- Collaborate with academic staff, teacher-practitioners, practice educators, and technical teams to ensure authentic learning experiences for students.

- Support the design and delivery of CPD training programmes for pharmacy technicians and other healthcare professionals.

- Provide patients with information and guidance on the correct use of prescribed medicines to promote adherence and understanding.

### 2.1.3.2 Billing and Administration

- Manage collection, billing, and compliance with national reimbursement and insurance systems, such as HSE community drug schemes in Ireland, under supervision.

- Maintain sales, reimbursement, and financial records, ensuring proper cash control and reconciliation.

- Organise and file administrative and financial documentation according to legal and organisational requirements.

- Assist pharmacy staff or professional members on the administration of agreements, claims, and payments in compliance with national regulations.

- Coordinate operational and administrative activities within educational or professional pharmacy organisations.

- Manage or assist with financial systems and basic accounting tasks.

- Support projects and initiatives such as webinars, newsletters, and helpdesk services.

### 2.1.3.3 Primary Care and Extended Care

*(This section covers GP out of hours, nursing home, health centres and any similar non-hospital/non-community pharmacy settings).*

- Manage medicines.

- Compile stock orders for medicines, dressings, ostomy products, sharps bins, PPE, etc.

- Monitor and stock medication bags for house calls.

- Collaborate with doctors and clinical nurses.

- Maintain electrocardiogram (ECG) machines and defibrillators.

### 2.1.3.4 Wholesale and Supply Services

- Provide customer service related to the supply of EMPs and other procured goods.

- Advise customers, including community pharmacies, on products and services.

- Deliver technical support for products and services.

- Sell services to community pharmacies.

### 2.1.3.5    Digital Health Tools

- Use digital health platforms such as ePrescribing systems, electronic health records (EHRs), and pharmacy management systems in line with national standards.

- Support the accurate entry, retrieval, and updating of medication-related information within digital systems.

- Operate digital medicines management tools, including barcode verification systems, automated dispensing technologies, and electronic medication administration processes.

- Ensure data accuracy, confidentiality, and compliance with digital health regulations.

- Assist in the implementation, troubleshooting, and optimisation of digital workflows within pharmacy services.

- Contribute to digital transformation initiatives across pharmacy settings, supporting safe and efficient medicines management.

## 2.2    EQF Level 5 and Above

At EQF Level 5 and above, pharmacy technicians expand their responsibilities to support broader healthcare activities, including vaccination programs, aseptic compounding in hospital pharmacies. Table 9 summarises the professional roles and responsibilities that are common to both Ireland and Portugal, highlighting the core tasks and duties expected of pharmacy technicians at this qualification level across these two countries.

*Table 9. Roles and Responsibilities of Pharmacy Technician (Common to EQF Levels 5 - 6)*

### 2.2.1    Community Pharmacy

### 2.2.1.1    Vaccine Programmes

- Contribute to vaccination programmes through coordination of supply, preparation, and documentation.
- Validate cold-chain integrity and monitor temperature control throughout vaccine handling.
- Perform dose reconciliation and workflow management to ensure accurate administration and reporting.
- Support audit and quality-assurance activities related to vaccination logistics.

### 2.2.2    Hospital Pharmacy

### 2.2.2.1    Aseptic Compounding Units (ACUs)

- Collect samples for microbiological monitoring of clean rooms.

### 2.2.2.2    National Cancer Control Programme

*(Note: this section may vary across countries (e.g., applicable in Ireland))*.

- Contribute to the ongoing review and improvement of aseptic safety procedures and handling standards.

- Develop national or institutional cancer drug management programmes through coordination of oncology medicine logistics and documentation.

- Contribute to the review and update of national chemotherapy regimens in collaboration with pharmacists and clinical governance teams.

- Assist in funding and audit processes for systemic cancer therapy programmes (e.g., Oncology Drugs Management System (ODMS) [16] in Ireland and other streams), including data collection and reporting.

- Collaborate on the implementation and maintenance of electronic systems for oncology medication management (e.g., National Cancer Information System (NCIS) [17] in Ireland).

### 2.2.2.3    Dispensary and Ward-Based Medicines Management

- Perform medicines-management activities on wards, including ordering of non-stock medications and assessment of patients' own medicines.

- Conduct medicines reconciliation, including verification of patients' medication histories and drug–drug interaction (DDI) checking for patients receiving specialised therapies, including antiretroviral or infectious disease treatments, under pharmacist supervision.

- Participate in the dispensing and verification of investigational medicinal products for clinical trials under pharmacist supervision.

### 2.2.2.4    Clinical Support and Research

- Liaise with healthcare organisations, including prison services, to ensure continuity of patients' therapy and adherence to treatment.

- Provide technical direction and assistance in the implementation of clinical trial protocols.

- Liaise with sponsor representatives and assist in preparing documentation for monitoring visits.

- Follow up on monitoring visit findings and support corrective or preventive actions under pharmacist supervision.

### 2.2.2.5    Industry Support

*(Note: Roles where pharmacy technicians provide clinical/technical expertise outside of direct patient care or clinical trial sites, supporting commercial, educational, or business objectives.)*

- Provide expert clinical support to the business, liaising with both internal and external stakeholders.

- Support business growth by working with management to assess the market landscape.

- Deliver product training and demonstrations to internal and external stakeholders.

- Educate the business on clinical indications for both existing and new products.

- Review Summaries of Product Characteristics (SmPCs).

- Analyse clinically and commercially to identify market gaps and optimise the product portfolio.

### 2.2.2.6    *Hospital Drugs Management Programme*

- Compile and report data on medication use and costs to support service monitoring and optimisation.

- Contribute to the implementation and maintenance of national hospital pharmacy medicines-management systems (e.g., Acute Hospitals Drugs Management Programme (AHDMP) in Ireland).

- Support the configuration of drug and supplier databases within electronic pharmacy management software.

- Participate in testing, validation, and user-training activities to ensure effective adoption of new digital tools.

### 2.2.3    Cross Setting

### 2.2.3.1    *Commercial & Supply Chain Management*

*Role focus: Key Account Manager – specialised medicines, ULM supply, and medication shortages*

- Maintain and strengthen professional relationships with hospital pharmacy teams and suppliers to ensure continuity of medicine supply.

- Identify and respond promptly to medicine shortages, coordinating alternative sourcing or therapeutic solutions in collaboration with pharmacists.

- Support the introduction and supply of new or unavailable therapies through liaison with external companies and authorised distributors.

- Oversee logistics processes to ensure quality standards and regulatory compliance throughout procurement and distribution.

**2.3    EQF Level 6**

At EQF Level 6, pharmacy technicians assume specialised roles that require advanced expertise and professional autonomy, including participation in disease management programs, point-of-care testing, specialised sterile preparation, and implementation of safety protocols. Table 10 summarises the professional roles and responsibilities at this level, highlighting that the majority of these tasks apply to pharmacy technicians in Portugal, while certain roles are applicable in Ireland for technicians who have completed advanced training at EQF Level 6.

*Table 10. Roles and Responsibilities of Pharmacy Technicians (Apply to EQF Level 6)*

| |
|---|
| **2.3.1. Community Pharmacy** |
| *2.3.1.1 Customer Service and Product Sales (Expanded Role)*<br>• Facilitate disease management programmes and point-of-care testing for infectious and chronic diseases. |
| *2.3.1.2 Primary Care Reimbursement Service (PCRS)*<br>• Process national reimbursement claims for community pharmacies in compliance with regulatory and financial requirements.<br>• Check for errors or fraudulent/duplicate claims and ensure accuracy of submitted data.<br>• Provide technical support for reimbursement queries and liaise with relevant authorities when required. |
| **2.3.2. Hospital Pharmacy** |
| *2.3.2.1    Specialised Sterile Preparation*<br>• Contribute to the development of chemotherapy safety protocols. |
| *2.3.2.1    Aseptic Practice and Quality Assurance*<br>• Supervise aseptic preparation activities to ensure compliance with Good Compounding Practice and internal quality procedures.<br>• Provide on-the-job training and guidance to new or junior pharmacy technicians in aseptic services.<br>• Contribute to quality-assurance tasks such as environmental monitoring, process validation, and internal audits. |

### 2.3.3. Cross-Setting

#### 2.3.3.1    Pharmacy Procurement

- Manage procurement processes for medicines and medical devices, ensuring compliance with institutional, legal, and ethical standards.

- Prepare and evaluate tender documentation for high-cost or specialised medicines.

- Assess and qualify applications from pharmaceutical suppliers for inclusion in authorised procurement or reimbursement systems (e.g., HSE Dynamic Purchasing System).

- Liaise with clinical, financial, and regulatory departments to ensure timely availability and cost-effective sourcing of products.

- Monitor supplier performance, delivery compliance, and contract adherence.

- Maintain transparent records of purchasing decisions to support audit and accountability processes.

#### 2.3.3.2    Billing and Administration

- Oversee reimbursement processes to ensure accuracy, regulatory compliance, and timely claim submission.

- Analyse reimbursement data to identify trends, discrepancies, or potential process improvements.

- Liaise with reimbursement authorities, health services, or contractors to clarify claim issues and ensure appropriate payments.

- Contribute to internal audits and reporting activities related to financial and reimbursement operations.

- Support the implementation of new digital or automated billing systems within the pharmacy.

- Maintain oversight of sales, reimbursement, and financial records, ensuring proper cash control and reconciliation.

- Oversee organisation and filing of administrative and financial documentation according to legal and institutional requirements.

- Supervise and advise pharmacy staff or professional members on the administration of agreements, claims, and payments.

- Coordinate operational and administrative activities within pharmacy organisations.

**Chapter 3. Professional and Transferable Skills of Pharmacy Technicians**

Beyond technical knowledge and practical competencies, pharmacy technicians require a broad set of professional and transferable skills to succeed in modern healthcare environments. These skills underpin employability, adaptability, and the ability to contribute effectively to multidisciplinary teams.

Chapter 3 identifies and describes these essential skills, which include:

- **Communication and interpersonal skills** – for effective patient counselling and collaboration with healthcare colleagues.

- **Digital literacy** – to engage with modern health technologies and pharmacy information systems.

- **Teamwork and leadership** – enabling technicians to work collaboratively and take on supervisory responsibilities as roles evolve.

- **Problem-solving and critical thinking** – supporting decision-making in complex and dynamic healthcare settings.

- **Ethical and professional conduct** – ensuring safe, patient-centred, and responsible practice.

These skills are mapped across EQF levels, showing how they develop progressively from basic competence to advanced professional capability.

By defining these transferable skills, the chapter provides guidance for educators, employers, and policymakers to ensure pharmacy technicians are equipped not only for current roles but also for future challenges as healthcare systems continue to evolve.

## 3.1 EQF Level 4 and Above

At the EQF Level 4 and above, common to Spain, Belgium, Ireland, and Portugal, the focus is on developing the essential professional skills required for safe and effective pharmacy practice. These include prescription processing, dispensation, consultation, sales, stock management, business awareness, health literacy promotion, and adherence to quality and regulatory frameworks. Complementing these are vital transferable skills such as communication, teamwork, problem-solving, critical thinking, and digital literacy, all of which enable Pharmacy Technicians to function as reliable healthcare professionals. Table 11 summarises these

professional and transferable skills, highlighting the competencies that are common across EQF Levels 4 to 6 and applicable in all four participating countries.

*Table 11. Professional and Transferable Skills of Pharmacy Technician (Common to EQF Levels 4 – 6)*

**Professional Skills**

- **Prescription processing** – Accurately interpret, enter, and dispense prescription and non-prescription medicines in compliance with relevant legislation and guidelines to ensure accurate dispensing and recordkeeping.

- **Dispensation & consultation** – Recommend suitable over the counter (OTC) and/or front-of-shop products based on customer needs and provide relevant information on the products.

- **Sales & merchandising** – Promote OTC products, assist with product displays, and upsell to improve sales while providing accurate product information to customers.

- **Stock management** – Place orders, check deliveries, restock, and monitor stock levels to ensure an efficient and well-regulated pharmacy workflow. Manage inventory to maintain an efficient pharmacy workflow. Monitor/manage medication shortages and try to identify/find alternative solutions.

- **Pharmacy business management** – Understand the basic knowledge and skills and apply to pharmacy business operation.

- **Health literacy & patient education** – Provide basic health and self-care advice on minor diseases, healthy living, and medication adherence.

- **Reception & triage of customers** – Recognise signs of urgency such as suspected ADRs, drug interactions, incorrect medication use, or worsening symptoms, and promptly refer to medical services, or emergency helplines.

- **Pharmacovigilance** – Identify and report suspected ADRs or medical error to the national regulatory authority.

- **Collaboration with healthcare professionals** – Communicate effectively with pharmacists, and hospital staff (doctors, and nurses) to optimise patient care.

- **Medication preparation** – Prepare and label individualised medicine according to prescriptions.

- **Pharmaceutical calculations** – Perform dosage calculations to ensure accurate medication dispensing.

- **Compounding medications** – Prepare medicines extemporaneously when required under prescription and pharmacy protocols.

- **Quality management control** – Understand and contribute to quality control processes and continuous improvement initiatives.

- **Regulatory compliance (patient safety)** – Partake in pharmacy operations safely and effectively under pharmacy protocols and relevant legislation.

- **Confidentiality & regulation protocols** – Demonstrate integrity and professionalism by maintaining patient confidentiality and adhering strictly to legal and ethical standards in all aspects of pharmacy practice.

- **Pharmacy software proficiency** – Use electronic health records and pharmacy management systems.

- **Waste management & environmental responsibility –** Disposal of medicines, sharps (e.g.: insulin needles), and pharmaceutical waste safely and in line with regulations. Advise patients on correct disposal and practices to ensure environmental safety and public health.

- **Identify and prevent falsified medicines** through inspection, authentication checks, and established pharmacy procedures.

- **Apply regulatory requirements related to falsified medicines** by understanding EU/national legislation and following correct reporting pathways.

- **Communicate and document suspected falsified medicines** accurately in accordance with pharmacy protocols.

- **Digital health competence** – Understand and apply digital health solutions used in medicines management, including ePrescribing and digital workflow systems.

**Transferable Skills**

- **Communication**
  - Communicate with empathy, demonstrating emotional intelligence when interacting with patients.
  - Effectively convey information and adapt communication styles based on the situation's audience, context, and complexity.
  - Demonstrate professional judgment in choosing appropriate communication channels when interacting with patients, team members, or external stakeholders. Effective listening skills.

- **Customer service** – Address inquiries and resolve concerns to ensure a positive experience.

- **Teamwork** – Be active team players and collaborative workers.

- **Work ethics** - Work with integrity, responsibility, professionalism, and respect.

- **Time management** – Handle multiple tasks in a fast-paced environment.

- **Problem-solving** – Address prescription errors, medication shortages, or other relevant challenging situations efficiently.

- **Conflict resolution –** Manage interpersonal challenges and resolve conflicts constructively within the teams and with clients.

- **Critical thinking** – Utilise critical thinking skills to analyse potential issues and i can be forward looking effective solutions.

- **Lifelong learning** – Commitment to ongoing personal and professional development through continuous learning and skill enhancement.

- **Initiative & self-motivation** - Demonstrate initiative and self-motivation in completing tasks and improving workflow.

- **Digital literacy** - Develop the digital literacy skills to appropriately and effectively use digital technologies, for learning, working and living in a digital age.

- **Attention to detail** – Ensure accuracy and meticulous attention to detail in all relevant tasks, such as managing prescriptions and maintaining patient records, to prevent errors.

## 3.2 EQF Level 5 and Above

At the EQF Level 5 and above, recognised in Ireland and Portugal, Pharmacy Technicians are expected to deepen their scientific understanding of pharmacology, strengthen collaboration with healthcare professionals, and apply microbiological knowledge in aseptic environments. Transferable skills at this level expand to include leadership, advanced communication, and process improvement, reflecting an increased level of responsibility and independence within the pharmacy setting. Table 12 summarises the professional and transferable skills expected of pharmacy technicians at EQF Level 5, highlighting competencies common to both Ireland and Portugal and illustrating the progression from foundational skills developed at EQF Level 4.

*Table 12. Professional and Transferable Skills of Pharmacy Technician (Common to EQF Levels 5 – 6)*

**Professional Skills**

- **Scientific understanding of the pharmacology of medications** – Understand how medicines are developed, manufactured and brought to the marketplace.

- **Collaboration with healthcare professionals** – Communicate effectively with pharmacists, doctors, and nurses to optimise patient care in both community and hospital pharmacy settings.

- **Microbiological monitoring and contamination control in aseptic environments** - Skilled in basic microbiology techniques such as culturing, staining, and interpreting microbial growth in quality control contexts.

**Transferable Skills**

- **Communication & collaboration -** Communicate with healthcare professionals, patients, and suppliers in both routine and complex situations and adapt communication styles to suit different professional audiences.

- **Leadership & team support -** Foster collaboration, coordinate daily workflow among pharmacy staff, mentor and provide guidance and feedback to junior personnel and trainees in line with pharmacy goals and quality standards.

- **Problem solving and process improvement –** Identify inefficiencies and propose improvements to optimise pharmacy workflow and protocols.

### 3.3    EQF Level 6

At the EQF Level 6, currently established in Portugal and Ireland (for upskilling purposes), Pharmacy Technicians take on highly specialised competencies. These include advanced clinical decision-making, evidence-based practice, business management, protocol development, and research literacy. At this stage, transferable skills also expand towards professional autonomy, enabling technicians to make informed decisions in both clinical and operational contexts, including patient-centred care and resource management. Table 13 summarises the professional and transferable skills expected of pharmacy technicians at EQF Level 6, highlighting the specialised competencies that reflect advanced training in Portugal and Ireland and demonstrating progression from skills developed at EQF Levels 4 and 5.

Table 13. Professional and Transferable Skills of Pharmacy Technician (Common to EQF Level 6)

**Professional Skills**

- **Clinical decision-making & evidence-based practice -** Applying clinical guidelines, research data, and drug information.

- **QA -** Contribute to internal audits, risk assessment, and quality improvement initiatives within pharmacy services.

- **Pharmacy business management -** Apply business and financial principles to support the effective operation of a pharmacy, including budgeting, profitability analysis, and pricing strategies.

- **Protocol development -** Participate in creating, reviewing, and revising pharmacy protocols and SOPs to ensure compliance with updated guidelines, regulatory changes, and safety standards.

- **Research literacy –** Critically evaluate and apply scientific literature and clinical data to inform pharmacy practice.

- **Advanced clinical risk assessments -** Evaluate complex patient cases for medication risks using evidence-based tools and clinical judgment to propose safer alternatives or interventions.

**Transferable Skills**

- **Professional autonomy -** Ability to make informed decisions in clinical and operational contexts, including adjusting medication for polymedicated patients and managing pricing and procurement strategies.

**Chapter 4. Conclusion and Future Directions**

**4.1    Concluding Synthesis**

This report represents the culmination of the *PharmTech Mobility: Enhancing European Pharmacy Technician Exchange and Mobility* Erasmus+ project, a collaborative initiative involving partners from Ireland, Belgium, Spain, and Portugal. Through a systematic comparative analysis of pharmacy technician education, professional roles and responsibilities, and professional and transferable skills, the project has addressed a critical and longstanding challenge within European healthcare systems: the absence of a shared reference framework to support transparency, recognition, and mobility for pharmacy technicians across national borders.

Chapters 1–3 collectively demonstrate that, while pharmacy technicians across Europe share a common professional purpose, their education pathways, regulatory status, and scopes of practice vary considerably. These differences, shaped by national healthcare models, regulatory traditions, and labour market needs, have historically limited cross-border recognition and professional mobility. At the same time, the analysis reveals substantial areas of convergence in curriculum content, core competences, and professional expectations, providing a strong foundation for alignment rather than uniformity.

By structuring the comparative educational framework around the EQF, this report offers a transparent and progressive model through which pharmacy technician education can be mapped, compared, and understood across systems. The framework recognises learning as cumulative and developmental, with knowledge, skills, and competences evolving from foundational vocational education at EQF Level 4 through to advanced, degree-level preparation at EQF Level 6. Importantly, it respects national autonomy while enabling mutual understanding, a balance that is essential for meaningful European cooperation.

**4.2    Education as the Cornerstone of Mobility**

Chapter 1 demonstrates that pharmacy technician education across the four participating countries encompasses a broad and increasingly sophisticated curriculum, integrating scientific foundations, pharmacy practice, professional development, and applied skills. Despite differences in delivery modes and qualification structures, common disciplinary domains emerge consistently, including pharmacy practice, pharmaceutical technology, pharmacology, microbiology, chemistry, and fundamental biological sciences.

A defining strength of the proposed framework is its explicit recognition of work placement as a core curricular component rather than a peripheral activity. Across all contexts, supervised experiential learning in community and hospital pharmacies plays a pivotal role in consolidating theoretical knowledge, developing professional behaviours, and preparing learners for safe and effective practice. By embedding work placement within the EQF-aligned framework, this report reinforces its importance as a shared European standard that enhances employability and readiness for mobility.

The inclusion of non-core but strategically important domains, such as sustainability, business administration, occupational health and safety, and nutrition and health, further reflects the evolving role of pharmacy technicians within modern healthcare systems. These domains align with wider EU priorities, including the Sustainable Development Goals, digital transformation, and workforce resilience, positioning pharmacy technicians as adaptable professionals capable of responding to future healthcare challenges.

## 4.3   Roles and Responsibilities in a Changing Healthcare Landscape

Chapter 2 highlights the expanding and increasingly differentiated roles of pharmacy technicians across community and hospital settings. While entry-level responsibilities remain focused on dispensing support, stock management, and customer service, advanced roles increasingly include aseptic compounding, ward-based medicines management, QA, and supply chain coordination.

The comparative analysis demonstrates that scope of practice is closely linked to education level, regulatory status, and healthcare context. In countries where pharmacy technicians are statutorily regulated and educated to higher EQF levels, their responsibilities are broader and more autonomous. Conversely, in less regulated environments, roles may remain constrained despite comparable skill sets.

By articulating roles and responsibilities across settings and levels, this report provides a structured reference that can support workforce planning, curriculum development, and policy dialogue. It also underscores the importance of aligning education with practice expectations, ensuring that pharmacy technicians are equipped not only with technical competence but also with the confidence and professional identity required to function effectively within multidisciplinary healthcare teams.

## 4.4    Professional and Transferable Skills for Employability and Resilience

Chapter 3 reinforces that technical competence alone is insufficient for contemporary pharmacy practice. Communication, teamwork, ethical awareness, digital literacy, adaptability, and reflective practice emerge as essential professional attributes across all participating countries. These transferable skills underpin patient safety, service quality, and collaboration within increasingly complex healthcare environments.

The explicit articulation of professional and transferable skills within this framework enhances transparency for employers, educators, and learners alike. It also strengthens the case for mutual recognition by demonstrating that pharmacy technicians across Europe are prepared to meet shared professional standards, even where national roles and regulations differ. Importantly, the emphasis on lifelong learning and professional development reflects the reality that pharmacy technician roles continue to evolve. As healthcare systems face demographic pressures, technological advances, and expanding pharmaceutical services, the capacity of pharmacy technicians to upskill and adapt will be critical to workforce sustainability.

## 4.5    Implications for Policy, Practice, and European Cooperation

The framework presented in this report is not intended as a regulatory instrument, nor does it seek to impose uniform curricula or scopes of practice. Instead, it functions as a shared European reference point, supporting dialogue among educators, regulators, professional bodies, and policymakers. By enhancing transparency and comparability, it lays the groundwork for improved recognition of qualifications, targeted mobility initiatives, and future alignment efforts.

For policymakers, the findings highlight the value of investing in structured, EQF-aligned education pathways that support safe delegation, workforce efficiency, and patient-centred care. For education providers, the framework offers a benchmark for curriculum review, quality enhancement, and international collaboration. For pharmacy technicians themselves, it provides greater visibility of career pathways, progression opportunities, and the skills required to practise across borders.

## 4.6    Future Directions

The PharmTech Mobility project represents an important step towards greater coherence in pharmacy technician education and practice across Europe, but it also opens avenues for future work. Potential next steps include:

- Expansion of the framework to additional EU member states, strengthening its representativeness and impact.
- Development of Erasmus+ mobility pathways and micro-credentials aligned with the framework.
- Further research into patient outcomes, service quality, and workforce efficiency associated with expanded pharmacy technician roles.
- Continued engagement with regulatory bodies to explore pathways towards enhanced recognition and professional regulation where appropriate.

## 4.7    Final Remarks

Pharmacy technicians are indispensable contributors to European healthcare systems. Their work supports the safe use of medicines, enhances service efficiency, and ultimately improves patient outcomes. By providing a robust, evidence-informed, and collaborative framework, the PharmTech Mobility project affirms the professional value of pharmacy technicians and supports their mobility, recognition, and development within the European Union.

This report therefore stands not only as a comparative analysis, but as an invitation to continued cooperation, innovation, and shared responsibility in shaping the future of the pharmacy technician profession across Europe.

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## Appendix 1. Stakeholder acknowledgements for contributions to the PharmTech Mobility Project

The project team would like to extend sincere thanks to the following individuals and organisations from various countries for their contributions to project development, workshops, and national consultations. Their engagement and feedback were invaluable throughout the project's design and implementation.

*Table 14. Stakeholders who contributed to the PharmTech Mobility Project.*

| Country | Organisation | Name |
|---|---|---|
| Belgium | Association of Pharmacy Technicians and Assistants of Belgium (AFPTAB)<br>Erasmus Brussels University College of Applied Sciences and Arts | Stephanie Mot |
| Ireland | Academic Affairs, TU Dublin | Nicole O'Neill |
| Ireland | Adrian Dunne Pharmacy | Sarah Gilson |
| Ireland | Atlantic Technological University | Michael Guckian |
| Ireland | Farrells Pharmacy Longwood | Mary Griffin |
| Ireland | Health Service Executive | Laura Lyons |
| Ireland | Health Service Executive | Grace Doyle |
| Ireland | Irish Institute of Pharmacy | Caitriona Bradley |
| Ireland | Irish Medicines Verification Organisation | Leonie Clarke |
| Ireland | Irish Pharmacy Union | Sinead McCool |
| Ireland | Irish Pharmacy Union | Pia Fennell |
| Ireland | NAPHT | Louise Hunt |
| Ireland | NAPHT | Leonor O'Connor |
| Ireland | Perrigo | Anne Marie O'Neill |
| Ireland | Pure Pharmacy | Brenda Flanagan |
| Ireland | Quality and Qualifications Ireland | Órla Barry |
| Ireland | Rotunda Hospital Dublin | Emer Coll |
| Ireland | School of Food Science and Environmental Health, TU Dublin | Julie Dunne |
| Ireland | School of Food Science and Environmental Health, TU Dublin | Mary Therese McGrath |
| Ireland | School of Pharmacy and Pharmaceutical Sciences, TCD | Sheila Ryder |
| Ireland | South East Technological University | Fiona Leonard |
| Ireland | South East Technological University | Nicola Cantwell |
| Ireland | St Vincent's University Hospital | Andrew Blyth |
| Ireland | St. Vincent's University Hospital | Caroline Gallagher |
| Ireland | Tallaght University Hospital | Sharon Curran-Rae |
| Ireland | Tallaght University Hospital | Monika Sofroni |
| Ireland | Tallaght University Hospital | Evelyn Deasy |
| Ireland | Technological University of the Shannon | Diane Patterson |
| Ireland | Technological University of the Shannon | Karen Mealiff |

| Ireland | UPMC Ireland | James Carr |
|---------|--------------|------------|
| Ireland | UPMC Ireland | Rebekah Corrigan |
| Norway | Sykehusapotek Nord HF | Lina Castro |
| Portugal | ACSS - Administração Central do Sistema de Saúde (Central Administration of the Health System, I.P.) | Fernando Mendes |
| Portugal | STSS – Sindicato Nacional dos Técnicos Superiores de Saúde das Áreas de Diagnóstico e Terapêutica (National Union of Health Technicians in Diagnostic and Therapeutic Areas) | Stakeholders |
| Portugal | APLF – Associação Portuguesa de Licenciados em Farmácia (Portuguese Association of Pharmacy Technicians) | - |
| Portugal | Escola Superior de Saúde de Bragança (Polytechnic Institute of Bragança) | Faculty contributors |
| Portugal | Escola Superior de Tecnologia da Saúde de Coimbra (Polytechnic Institute of Coimbra) | Faculty contributors |
| Portugal | Escola Superior de Saúde da Guarda (Polytechnic Institute of Guarda) | Faculty contributors |
| Portugal | Escola Superior de Tecnologia da Saúde de Lisboa (Polytechnic Institute of Lisbon) | Faculty contributors |
| Portugal | Escola Superior de Saúde (Polytechnic Institute of Porto) | Faculty contributors |
| Portugal | Escola Superior de Saúde (University of Algarve) | Faculty contributors |
| Spain | Ministerio de Educación, Formación Profesional y Deportes | |
| Spain | Fundación Dales La Palabra | Piedad Sancristóval Zurita |
| Spain | Colegio Tres Olivos | Adoración Juárez Sánchez |
| Spain | Infanta Leonor University Hospital, Pharmacy Hospital | Ismael Escobar Rodríguez |
| Spain | Spanish Society of Clinical, Family and Community Pharmacy | Fernando Cantalapiedra Fernández |
| Spain | Farmatalent (Talent advisory and consulting services firm) | Paloma Carpintero Navarro |