**Module Descriptor**

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| **Module Title:** | | **Digital Health Technologies: Integration and Application of Medical and Consumer Devices** | | | | | |
| **Module Code:** | | **PHTY41230** | | | | | |
| **Module Coordinator:** | | | *Dr Cailbhe Doherty* | | | | |
| **Credits:** | **5** | | | **Level: 4** | |  | **Trimester: 1** |
| **Module Places** | | | 30 | | | | |
| **Module Dependencies: Pre-requisite: Not applicable** | | | | | | | |
| **Indicative Module Description:**  *This module aims to equip students with a comprehensive understanding of the digital health ecosystem, focusing on the integration of: i) medical-grade devices and ii) consumer health devices (including fitness trackers, smartwatches, and health monitors) within healthcare.*  *It delves into the theoretical underpinnings and practical applications of these technologies, examining their design, functionality, and the role they play in measuring and monitoring health. Students will explore the evolution of medical devices from traditional applications to the burgeoning field of wearable technology, emphasizing the blend between healthcare delivery and monitoring health and wellness.*  *Through a detailed examination of different kinds of sensors, biometric outcomes, and algorithmic data analysis, the module provides insights into the technical workings and clinical relevance of these devices—including their validity. It addresses the role of data privacy, security, and regulatory compliance, preparing students to navigate the complexities of digital health with an informed, ethical perspective.* | | | | | | | |
| **What will I learn?**  **Learning Outcomes**  *On completion of this module students should be able to:*   1. *Understand the design and functionality of a range of commonly used medical devices and their principles of operation* 2. *Evaluate the safety and regulatory requirements for medical devices Analyse the data collected from medical devices and its potential uses in healthcare* 3. *Evaluate the role and potential benefits of commercial wearable technology in healthcare* 4. *Analyse the data collected from commercial wearable technology and its potential uses in healthcare* 5. *Evaluate the data privacy and security issues associated with using wearable technology in healthcare*   **Indicative Module Content:**  *Introduction to Digital Health Ecosystems*  *Medical Imaging Technologies (Radiology, Endoscopy, Clin Photography, Digital Pathology, etc).*  *Physiological Measurement Devices (e.g., photoplethysmography, inertial measurement units).*  *Anaesthetic and Critical Care Medical Devices.*  *The use of ICT and Informatics in the medical devices area.*  *Data types and quantities related to Medical Devices.*  *Data security aspects related to Medical Devices.*  *The differences between consumer devices and medical devices.*  *The role of medical devices as drivers or facilitators of behaviour change.*  *The role of digital health apps in eHealth.*  *The future directions of digital health in clinical practice.* | | | | | | | |
| **How will I learn?**  **Learning Activities:** | | | | | **Indicative Hours:** | | |
| Lectures | | | | | 20 | | |
| Specified learning activities | | | | | 30 | | |
| Autonomous student learning | | | | | 60 | | |
| Total | | | | | 110 | | |
| **Approaches to teaching and Learning**  *The module includes a blend of synchronous online lectures, asynchronous material, self-directed learning, and project-based assessment. Emphasis is placed on interactive learning, with case studies and practical examples drawn from current research and healthcare practices.* | | | | | | | |
| **Am I eligible to take this module?**  ***Pre-requisite:*** *Not applicable to this module.* | | | | | | | |
| **How will I be assessed?**  **Description**  *Continuous assessment (20%): Completion of learning units (including pre-recorded multimedia content and quizzes) in the Virtual Learning Environment (Brightspace). 20%.*  *Assignment: Students will be required to complete and submit a project related to module content. The format of the project will be decided by class consensus, but could include a presentation, a review of the literature, a piece of multimedia or a research task.* | | | | | | | |
| **What happens if I fail?**  *Repeat within two trimesters* | | | | | | | |
| **Assessment Feedback**  **Feedback Strategy/Strategies**  *Students will receive general feedback on their performance during the MCQ and class tests through Brightspace.*  **How will my Feedback be Delivered?**  *In-person feedback on examination performance can also be provided upon the request of the student. In such instances the module coordinator will arrange to meet with the student to discuss the examination performance.* | | | | | | | |

LECTURE PLAN

Photoplethysmography (HR, HRV, RR)

Polysomnography

Accelerometery