The Hong Kong Polytechnic University

Subject Description Form

Please read the notes at the end of the table carefully before completing the form.

Subject Code	BME5111
Subject Title	Wearable Technology for Digital Health
Credit Value	3
Level	5
Pre-requisite/ Co-requisite/ Exclusion	Nil
Objectives	Wearable technology is becoming a hot commodity that enables personal health tracking over long periods, while healthcare providers and physicians can make better clinical decision based on the remote data. This subject aims to enable students to 1) understand how wearable technology can facilitate digital health to evaluate and improve health and fitness; 2) appreciate the applications of wearable technology in digital health for different populations; 3) gain hands-on experience in implementing state-of-the-art wearables and digital health data analysis; and 4) discuss the opportunities and challenges in wearable technology and digital health.
Intended Learning Outcomes *(Note 1)*	Upon completion of the subject, students will be able to: a. Appreciate the key functions and basic principles of various wearable technologies; b. Recognize the demand and importance of wearable technology and digital health data in different populations; c. Comprehend basic operation of wearable technology, data collection, handing, visualization, analytics, and machine learning. d. Demonstrate understanding to the design, development, marketing and other contemporary issues in wearable technology; e. Critically appraise the strengths and limitations of current wearable healthcare devices and predict future trend in this area.

Subject Synopsis/ Indicative Syllabus *(Note 2)*	■ Digital Health data: definitions, data collection and visualization, accuracy, normal aging effects, other factors influencing the measured data
	■ Comprehensive understanding on healthcare data: evaluation of health and fitness status, understanding on different diseases, disabilities and populations that can be reflected by the healthcare data
	■ Basic concepts of sensors and feedback technology
	■ Understanding and evaluation of wearable technology that are used to evaluate and promote health and fitness for healthy and disabled people
	■ Design and application of X-reality technology
	■ Hands-on experiences in wearables

Teaching/Learning Methodology *(Note 3)*	There will be lectures about commonly used healthcare data, sensing and feedback technologies. Some guided reading and self-study will further extend their knowledge in respective areas. Group presentation among students will be arranged in the class, on the topics related to wearable technology, application, or other contemporary issues.
	Hands-on and illustration sections will be arranged to enable students to develop the necessary skills in wearable device and system for a mini-project. In the group project, students need to work together on a mini-project with hands-on experience in wearable technology and perform data analytics and cloud computing for an individual lab report. The students will have the chance to show and demonstrate their mini-project to other classmates.

Assessment Methods in Alignment with Intended Learning Outcomes

(Note 4)

Specific assessment methods/tasks	% weighting	Intended subject learning outcomes to be assessed				
		a	b	c	d	e
1. Quiz	30%	√	√		√	
2. Individual laboratory report	20%	√	√	√	√	
3. Group mini-project with demonstration	20%	√	√	√	√	
4. Group Presentation	30%	√	√	√	√	√
Total	100 %					

Student Study Effort Expected	Class contact:	
	▪ Lecture	22 Hrs.
	▪ Tutorial	9 Hrs.
	▪ Quiz	2 Hrs.
	▪ Laboratory work / Practical	6 Hrs.
	Other student study effort:	
	▪ Mini-Project	38 Hrs.
	▪ Group Project Presentation	20 Hrs.
	▪ Self-study	20 Hrs.
	Total student study effort	117 Hrs.
Reading List and References	**Textbooks** ▪ Isabel Pedersen (Editor), Andrew Iliadis (Editor), Embodied Computing: Wearables, Implantables, Embeddables, Ingestibles (The MIT Press), 2020. ▪ Haider Raad, Fundamentals of IoT and Wearable Technology Design, Wiley, 2021. ▪ Fawzi Behmann, Kwok Wu, Collaborative Internet of Things (C-IOT) For Future Smart Connected Life and Business. Hoboken: John Wiley and Sons, Inc., 2015. ▪ Janet Holland, Wearable technology and Mobile Innovation for Next-Generation Education. Hershey, PA: Information Science Reference, 2016. **Other Reading Materials** ▪ http://www.medgadget.com ▪ https://www.wareable.com/ ▪ Selected publications from relevant journals ▪ Scientific American, Scientific American Inc. ▪ Popular Mechanics, Popular Mechanics Co. ▪ Popular Science, Bonnier Co.	

Note 1: Intended Learning Outcomes
Intended learning outcomes should state what students should be able to do or attain upon subject completion. Subject outcomes are expected to contribute to the attainment of the overall programme outcomes.

Note 2: Subject Synopsis/Indicative Syllabus
The syllabus should adequately address the intended learning outcomes. At the same time, overcrowding of the syllabus should be avoided.

Note 3: Teaching/Learning Methodology
This section should include a brief description of the teaching and learning methods to be employed to facilitate learning, and a justification of how the methods are aligned with the intended learning outcomes of the subject.

Note 4: Assessment Method
This section should include the assessment method(s) to be used and its relative weighting, and indicate which of the subject intended learning outcomes that each method is intended to assess. It should also provide a brief explanation of the appropriateness of the assessment methods in assessing the intended learning outcomes.

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