

Interdisciplinary Program in Precision Public Health

I. Educational Objectives

Medical technology is rapidly becoming highly sophisticated. For instance, Precision Medicine using genomic and clinical data enables more effective personalized treatments; advances in data science utilize massive information-processing capabilities to accurately predict diseases; and various cutting-edge technologies like Artificial Intelligence (AI) are applied to personalized disease prevention and treatment, shifting the paradigm of medicine. However, the development of such personalized medical technology has limitations in solving the complex social problems of an aging society due to the following reasons:

1. **Individual Focus Over Population Factors:** While current medical technology innovations and data science advancements focus on individual patients—such as molecular biological information (including genes) and clinical data—they do not encompass the social, economic, and environmental factors that are major causes of disease occurrence in populations.
2. **Neglect of Disease Prevention:** Precision medicine, which focuses on personalized disease diagnosis and treatment, neglects the realm of disease prevention. In an aging society, extending a healthy lifespan without illness is far more meaningful than simply extending life expectancy; thus, prevention is more important than treatment. According to 2016 Statistics Korea data, the gap between the life expectancy and healthy lifespan of Koreans was 17.5 years, meaning that due to a failure to prevent disease, individuals spend the last 17.5 years of their lives in poor health. Prevention is a much more effective solution, not only for an individual's quality of life but also in terms of social costs.
3. **Disconnection Between Technology and Public Health:** Due to the disconnect between technology and public health, the benefits of today's technological innovations are concentrated in specific classes with the resources to access them, widening the health gap with those who do not. Medical technology and data science innovation trends that are not grounded in public health awareness amplify this issue. For example, higher-income groups within a country diagnose diseases early through cancer screenings or genetic testing and receive appropriate treatment, resulting in differences in mortality rates across social classes.

Under these circumstances, how to achieve "healthier aging" in an aging society through advanced medical technology is an issue on which the nation's future depends. To achieve this, it is absolutely necessary to:

- Extend healthy lifespans through a comprehensive life-cycle health management approach.

- Implement interventions focused on prevention rather than treatment, considering the quality of life.
- Develop health promotion technologies and implement disease prevention programs tailored for low-income elderly populations.

This Interdisciplinary Program in Precision Public Health brings together experts in engineering, life sciences, data science, and public health. It aims to identify immediate public health challenges from a creative perspective, educate students on scientific and technological innovations to solve these problems, and conduct collaborative research. Ultimately, the goal is to cultivate leaders equipped with the capability to solve current and future public health issues facing our society.

II. Academic Fields (Majors)

- Interdisciplinary Program in Precision Public Health

III. Departmental Regulations

1. Curriculum Completion Regulations

The Interdisciplinary Program in Precision Public Health is operated as an Additional Completion Type (추가 이수형) program.

2. Completed Courses and Credit Recognition

The completion and recognition of credits for this interdisciplinary program follow Chapter 3 (Bylaws for Additional Completion Type Interdisciplinary Programs) of the *Bylaws for the Establishment and Operation of Graduate School Interdisciplinary Programs*, and are specified as follows:

- 1) To complete the interdisciplinary program, applicants must complete an additional 12 credits for the Master's program and 15 credits for the Doctoral program. Up to 6 credits can be double-counted (overlapping recognition) with courses from the student's primary (original) major.
- 2) Applicants must complete a mandatory minimum number of credits from the core courses offered by the interdisciplinary program: 6 credits for the Master's program and 9 credits for the Doctoral program. The applicable core courses are:
 - *Introduction to Precision Public Health (PPH501)*
 - *Precision Public Health Convergence Research Methodology I (PPH502)*
 - *Precision Public Health Convergence Research Methodology II (PPH503)*
 - *Precision Public Health Practicum I (PPH504)*

- *Precision Public Health Practicum II (PPH505)*
 - *Precision Public Health Seminar I (PPH506)*
 - *Precision Public Health Seminar II (PPH507)*
 - *Precision Public Health Venture Research (PPH508)*
- 3) Regarding credits completed in other departments, if deemed necessary, a student may submit an external department enrollment application form before the course registration modification period. Upon the approval of both the academic advisor and the Department Chair, a maximum of 6 credits can be recognized as major credits.
 - 4) A Master of Science (M.S.) or Ph.D. in Science can be awarded if the student fulfills the requirement of completing 12 or more credits (Master's) or 15 or more credits (Doctoral) in *Natural Science track* courses.
 - 5) A Master of Engineering (M.E.) or Ph.D. in Engineering can be awarded if the student fulfills the requirement of completing 12 or more credits (Master's) or 15 or more credits (Doctoral) in *Engineering track* courses.
 - 6) A Master of Public Health (M.P.H.) or Ph.D. in Public Health can be awarded if the student fulfills the requirement of completing 12 or more credits (Master's) or 15 or more credits (Doctoral) in *Public Health track* courses.
 - 7) A Master of Arts (M.A.) or Ph.D. in Literature/Arts can be awarded if the student fulfills the requirement of completing 12 or more credits (Master's) or 15 or more credits (Doctoral) in *Humanities track* courses.
 - 8) Courses offered by the Interdisciplinary Program in Precision Public Health that a student completed *before* officially applying to the interdisciplinary program can be recognized toward the required completion credits for the program.
 - 9) For students who entered prior to the 1st semester of 2020, courses that they completed but have since been abolished can be officially recognized as major courses upon the approval of the academic advisor and the Department Chair (independent of the condition in Clause 3 above).

3. Advisor-Designated Courses

After admission and prior to the start of the semester, new students must conduct an interview with their academic advisor to be assigned designated undergraduate courses or graduate courses (in the case of the Doctoral program). These designated courses must be approved by the academic advisor and the Department Chair, and their completion is mandatory.

4. Appointment of Academic Advisors

Immediately after applying for the interdisciplinary program, the student receives a recommendation for the most suitable academic advisor from among the department faculty through a group or individual interview conducted either in writing or face-to-face with the Department Chair. The academic advisor is officially selected upon obtaining that respective professor's consent.

5. Comprehensive Examination

The comprehensive examination is waived and replaced by the examination taken in the student's primary (original) major department.

6. Degree Thesis/Dissertation Submission and Defense

- 1) To be eligible to submit a degree thesis or dissertation, applicants must satisfy the following credit and educational requirements:
 - Credit Requirements (with a minimum GPA of 3.0 or higher, completed or expected to complete):
 - *Master's Program:* 30 or more total credits (including 24 credits from the primary major and 12 or more credits from the interdisciplinary program, inclusive of the 6 overlapping credits).
 - *Doctoral Program:* 39 or more total credits (including 30 credits from the primary major and 15 or more credits from the interdisciplinary program, inclusive of the 6 overlapping credits).
 - *Integrated Master's/Doctoral Program:* 57 or more total credits (including 48 credits from the primary major and 15 or more credits from the interdisciplinary program, inclusive of the 6 overlapping credits).
 - Mandatory Training Requirements:
 - Research Ethics Education (1 time)
 - Human Rights and Gender Equality Education (1 time)
 - Disability Awareness Improvement Education (1 time)
 - Laboratory Safety Education (every semester)
- 2) For all other graduation criteria, if the student satisfies the graduation requirements demanded by their primary (original) major, the graduation requirements for this interdisciplinary program are considered fulfilled as well.

7. Interdisciplinary Program Completion Requirements

In addition to the program's required completion credits, applicants must complete the general common graduate course, *Course for Graduate School New Students (GRA511)*, as a mandatory requirement.

However, if a student participated in this interdisciplinary program during their Master's degree, completed the corresponding course (GRA511), and obtained their Master's degree, and then proceeds to the Doctoral program and rejoins this interdisciplinary program, the course completed during the Master's program will be recognized as fulfilled.

8. Miscellaneous

- 1) Matters not explicitly specified in these bylaws shall comply with the Graduate School Academic Regulations and Enforcement Rules.
- 2) *Practicum in Biomedical Engineering I* and *Practicum in Biomedical Engineering II* offered by the Department of Biomedical Engineering are recognized as equivalent to having completed *Precision Public Health Practicum I (PPH504)* and *Precision Public Health Practicum II (PPH505)*, respectively.
- 3) Students whose majors do not primarily involve laboratory-based experimental research may be exempted from the "Laboratory Safety Education (every semester)" requirement specified in Clause 1 of Section 6 (Degree Thesis/Dissertation Submission and Defense).

Addenda (부칙)

- 1) (Enforcement Date) These bylaws shall take effect on September 1, 2020.
- 2) (Transitional Measures) For students who have completed 2 or more semesters in the Master's program, 2 or more semesters in the Doctoral program, or 4 or more semesters in the Integrated program as of the 1st semester of 2020, the mandatory core course requirements specified in Clause 2 of Section 2 (Completed Courses and Credit Recognition) shall not apply.
- 3) (Transitional Measures) For students scheduled to graduate in February or August 2021, the requirement stating that "the thesis/dissertation defense committee must include 2 or more BK-participating faculty members" (previously under Clause 2 of Section 6) shall not apply.
- 4) (Transitional Measures) The credit acquisition requirements specified in Clause 1 of Section 6 (Degree Thesis/Dissertation Submission and Defense) of these revised bylaws shall apply to students entering from March 1, 2021, onward.
- 5) (Enforcement Date) These revised bylaws shall take effect on March 1, 2021.

- 6) (Transitional Measures) The interdisciplinary program completion requirements outlined in Section 7 of these revised bylaws shall apply to students entering from March 1, 2022, onward.
- 7) (Transitional Measures) The provision in Section 7 regarding the exemption/recognition of the course (GRA511) for Master's degree graduates entering the Doctoral program shall apply retroactively to enrolled Doctoral students who entered after March 1, 2022, and are subject to the mandatory completion of (GRA511).