

# Guidelines for the WISE Program for Nano-Precision Medicine, Science, and Technology

The purpose of the WISE Program by Ministry of Education, Culture, Sports, Science and Technology (MEXT) is to foster doctoral students (highly knowledgeable professionals) who will be able to lead the creation and utilization of new knowledge, create value that will lead the next generation, and bring innovation to society by taking on the challenge of solving social issues. To this end, WISE Program for Nano-Precision Medicine, Science, and Technology (HaKaSe<sup>+</sup> for WISE) will select and support individuals who have the motivation and aptitude stipulated in the desired student profile of this program.

## 1. Outline of HaKaSe<sup>+</sup> for WISE

In 2015, "Precision Medicine" was proposed in the United States and has been attracting worldwide attention. Precision medicine aims at optimal treatment at the individual patient level by genetic analysis using the latest technology. However, genetic analysis alone is not sufficient and many diseases have not been overcome yet.

Kanazawa University, by leveraging the strength of nanoprobe microscopes, is a pioneer in establishing a hub for interdisciplinary and systematic education and research to "create innovative prevention, diagnosis, and treatment methods by developing devices and materials with nano-level controls," leading the creation and utilization of new knowledge referred to as **nano-precision medicine/nano-precision science and technology** that can also be applied to personalized medicine, and will produce scientists around the world who bring innovation to society.

Therefore, HaKaSe<sup>+</sup> for WISE focuses on five global medical issues, i.e. cancer, lifestyle-related diseases, neurological diseases, diseases caused by fine particles, and diseases caused by nanomaterials, and fosters students to be trained as **nano-precision medicine professionals who are strong in technology** as well as **nano-precision science and technology professionals who are strong in medicine** who will be responsible for creating innovative prevention, diagnosis, and treatment methods by promoting understanding and control of these diseases at the nano level.

## 2. Profile of individuals to be fostered

HaKaSe<sup>+</sup> for WISE fosters students to become outstanding researchers with a doctoral degree, **highly knowledgeable professionals**, who have **a high degree of expertise** in nano-measurement with **the ability to take a comprehensive view** to understand various life phenomena at the nano level and **creativity** for new innovations in nano-precision medicine, science and technology. Further, they should have **social implementation skills** to disseminate the results to society. Specifically, HaKaSe<sup>+</sup> for WISE aims to develop scientists with the following abilities:

- i) Professionals with multidisciplinary in medicine and science and technology who are active beyond existing boundaries such as pharmaceutical health sciences and science and technology;
- ii) Specialists who are familiar with the practices at each stage of "prevention, diagnosis, and treatment;"
- iii) Highly knowledgeable professionals who play a key role in a group with diverse backgrounds.

HaKaSe<sup>+</sup> for WISE fosters **nano-precision medicine professionals who are strong in technology** and **nano-precision science and technology professionals who are strong in medicine** with these three qualifications.

### [The desired student profile]

HaKaSe<sup>+</sup> for WISE widely recruits students from the 4 Graduate Schools: The Graduate School of

Natural Science and Technology, the Graduate School of Medical Sciences, the Graduate School of Advanced Preventive Medical Sciences, and the Graduate School of Frontier Science Initiative and selects students demonstrating the following motivations and aptitudes:

- ◆ Those with a strong interest and willingness to study nanoscience and nanotechnology and with basic academic ability in fields related to science, technology, medicine, medical science, pharmacy, pharmaceutical science, health sciences, or other academics;
- ◆ Those with a broad perspective and creativity, rich humanity and social skills, high ethical standards, and motivation to solve health problems;
- ◆ Those who are interested in the latest scientific and technological trends, want to change society through innovation and new businesses, and aim to contribute to society;
- ◆ Those who are not bound by existing structures such as countries, regions, societies and institutions or specialized academic fields but who have a tolerant attitude toward different cultures and other people, as well as having excellent communication skills. They must be multifaceted and logical even in fields with different specialties and be able to engage in cross-cultural exchange activities.

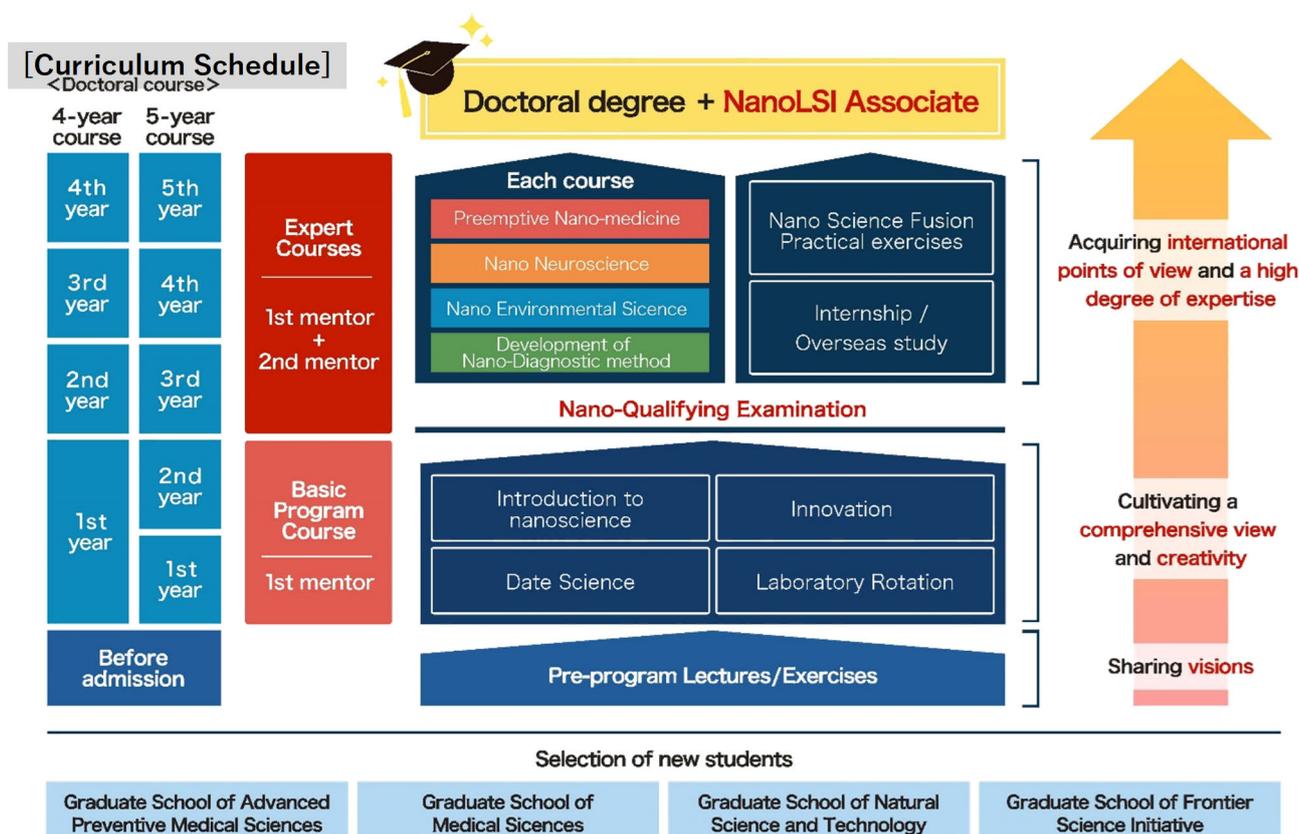
### 3. Requirements for completion

The curriculum of HaKaSe<sup>+</sup> for WISE consists of a "Basic Program Course" that cultivates creativity and a comprehensive view of nanoscience, and "Expert Courses" that cultivate international points of view and a high degree of expertise.

In addition to the requirements for completion by the Graduate School to which the students of HaKaSe<sup>+</sup> for WISE belong, students are required to acquire the credits imposed by the "Basic Program Course" and "Expert Courses," and to pass the doctoral thesis dissertation examination and final examination.

Those who have successfully completed HaKaSe<sup>+</sup> for WISE will be awarded a doctoral degree as stipulated in the Rules of Degree of Kanazawa University, and completion of HaKaSe<sup>+</sup> for WISE will be stated in each diploma.

- ◆ Title to be added to the diploma: Completion of the WISE Program for Nano-Precision Medicine, Science, and Technology



**[Required courses for HaKaSe<sup>+</sup> for WISE] (New Enrollees in FY2023 or later)**

**【5-year Integrated Course】**

(Master's Level Section of Integrated Course / Master's Course)

Course	Subject	Credit(s) awarded
Basic Program Course	Introduction to Nano Precision Medicine, Science and Engineering	1 credit
	Introduction to Nano Science	2 credits

(Doctoral Level Section of Integrated Course)

Course	Subject	Credit(s) awarded
Expert Courses	Nano Science Fusion Practical Exercises	1 credit
	Required Subjects for Each Expert Course	2 credits

**【4-year Doctoral Course】**

Course	Subject	Credit(s) awarded
Basic Program Course	Introduction to Nano Precision Medicine, Science and Engineering	1 credit
	Introduction to Nano Science	2 credits
	Laboratory Rotation	1 credit
Expert Courses	Nano Science Fusion Practical Exercises	1 credit
	Required Subjects for Each Expert Course	2 credits

- In addition to the above, students can take elective courses to further deepen their studies.
- Please note that there are some classes that are recommended to be taken in 1st Quarter (Q1) of the year in which you start HaKaSe<sup>+</sup> for WISE to meet the requirements for completing HaKaSe<sup>+</sup> for WISE.

**Applicants who belong to graduate schools, courses, and divisions as the target for support of HaKaSe<sup>+</sup> for WISE are to take classes systematically even before the result of the selection of Kanazawa University Strategic Project for Development of Doctoral Students and Research Promotion (HaKaSe<sup>+</sup>), April 2024 will be notified.**

Note: if applicants belonging to the following graduate schools, courses, or divisions would like to take classes in the HaKaSe<sup>+</sup> for WISE, please ask the person in charge.

Affiliation of an applicant	Person in charge
All divisions, Master's Level Section of Integrated Course, Graduate School of Natural Science and Technology	Graduate School Affairs Section, Student Affairs Division, Science and Engineering Administration Department
Division of Pharmaceutical Sciences, Master's Level Section of Integrated Course, Graduate School of Medical Sciences	Pharmacy Student Affairs Section, Faculty of Pharmacy and Cancer Research Institute Support Division, Medical, Pharmaceutical and Health Administration Department
Division of Pharmacy, Doctoral Course, Graduate School of Medical Sciences	

## **Class subjects that should be considered as registering for 1st Quarter (Q1) of FY2024**

[Required Subjects in HaKaSe<sup>+</sup> for WISE]

- Introduction to Nano Science (conducted in Q1 and Q2) :  
For both **【5-year Integrated Course】** (Master's Level Section of Integrated Course / Master's Course) and **【4-year Doctoral Course】**
- \* For students belonging to the Division of Nano Life Science, Graduate School of Frontier Science Initiative, obtaining the credits of 2 subjects "Basic Nano Life Sciences" and "Fundamentals of Nanoscale Measurement Technology" corresponds to taking this subject.

[Subjects for which HaKaSe<sup>+</sup> for WISE specifies acquisition requirements]

- 【5-year Integrated Course】** (Master's Level Section of Integrated Course / Master's Course)
  - Acquire 1 credit of "Data Science in Society 5.0" (conducted in Q3/Q4) or "Mathematical, Data Science, and AI Basic" (conducted in Q1/Q3 for adult students, conducted in "Q2/Q4 for other students) in GS Basic Courses for Postgraduates
  - Acquire 1 credit of "Strategy for Business and Technology Management" (conducted in Q1), "Innovation in Healthcare" (conducted in Q2) or "MOT as for Disruptive Innovation" (conducted in Q3) in GS Basic Courses for Postgraduates
- \*The HaKaSe<sup>+</sup> for WISE Students in Field of Midwifery, Division of Health Sciences, Graduate School of Medical Sciences are to earn 2 credits of the above subjects and 1 credit of "Laboratory Rotation I , II" regardless of the acquisition requirements for completing the field.

[Elective Subjects in the HaKaSe<sup>+</sup> for WISE]

- English for Environmental and Energy Technology (Conducted in Q1 and Q2) :  
For both **【5-year Integrated Course】** (Master's Level Section of Integrated Course / Master's Course) and **【4-year Doctoral Course】**

- Please note the following points after the 2nd Quarter (Q2) onwards of the year in which you start HaKaSe<sup>+</sup> for WISE.

**【5-year Integrated Course】** (Master's Level Section of Integrated Course / Master's Course)  
When conducting "Laboratory Rotation I (Category I)" in "Laboratory Rotation I , II" of GS Basic Courses for Postgraduates, students in Science and Engineering field are to conduct research in choose a laboratory in Medical, Pharmaceutical and Health Sciences field, and, on the other hand, students in Medical, Pharmaceutical and Health Sciences field are to conduct research in a laboratory in Science and Engineering field.

**【4-year Doctoral Course】**

Regarding compulsory elective subjects in GS Advanced Courses for Postgraduates, "Mathematical, Data Science, and AI Advanced" is recommended to be taken.

[Nano-Qualifying Examination]

In HaKaSe<sup>+</sup> for WISE, students are required to take and pass the Nano-Qualifying Examination in order to proceed from the "Basic Program Course" to the "Expert Courses" and from the Master's Level Section of Integrated Course to the Doctoral Level Section of Integrated Course. The Nano-Qualifying

Examination consists of a written examination imposed by HaKaSe<sup>+</sup> for WISE and Qualifying Examination (QE) conducted by the relevant graduate school.

[Pre-program lectures/exercises]

Pre-program lectures/exercises will be held for students selected for HaKaSe<sup>+</sup> for WISE after May 2024 onwards. This is conducted as a required subject "Introduction to Nano precision medicine, science and engineering," which is positioned as a Basic Program Course. HaKaSe<sup>+</sup> for WISE will notify the details to students selected for this program.

#### **4. Financial Support**

Based on the purpose of the WISE Program, HaKaSe<sup>+</sup> for WISE will provide the following substantial financial support to students who have pledged to various matters specified separately by Kanazawa University as an environment in which they can devote themselves to education and research.

##### 1) Full exemption of entrance fee and tuition fee

All students enrolled in HaKaSe<sup>+</sup> for WISE are fully exempted from entrance and tuition fees.

Please note that the tuition fee exemption is limited to the standard period of study stipulated in the Graduate School Rules for Kanazawa University.

##### 2) Benefit-type grant for living expenses

In principle, a grant for living expenses as described below will be provided to students who are awardees of HaKaSe<sup>+</sup> for WISE with excellent records but only within the standard period of study.

Students of the Master's Level Section of Integrated Course / Master's Course, 50,000 yen per month

Students of the Doctoral Level Section of Integrated Course / Doctoral Course, 180,000 yen per month

The payment of the grant for living expenses, including its amount, will be decided by review every year based on the "Detailed Rules for Kanazawa University's WISE Program's Education and Research Support Scholarship."

##### 3) Research fund

Research fund (400,000 yen per year) will be provided to students of the Doctoral Level Section of Integrated Course / Doctoral Course.

##### 4) Research Assistant salary

A Research Assistant salary will be paid to students of the Master's Level Section of Integrated Course / Master's Course or the first-year students of 4-year Doctoral Course who are hired as research assistants for research projects of HaKaSe<sup>+</sup> for WISE staff.

##### 5) Research travel expenses

Research travel expenses for internships, study abroad, or for presentations of research results at international conferences will be provided within a certain range.

Note: Those described in 2), 3), 4) and 5) may change depending on the budget status of HaKaSe<sup>+</sup> for WISE.

#### **5. Program Staff**

79 Staff members (as of March, 2024)

Website: <https://nano-wise.w3.kanazawa-u.ac.jp/en/>

## **6. Contact Information**

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\*Please replace [at] with @.