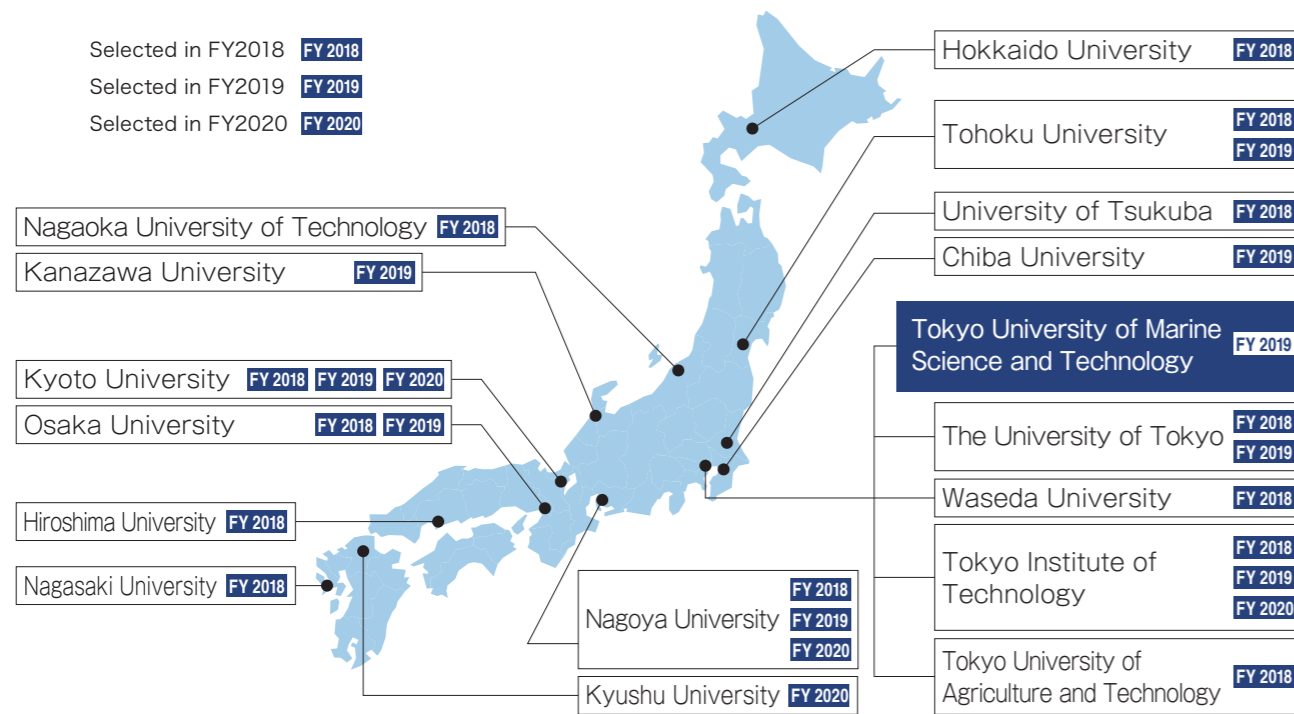


Doctoral Program for World-leading Innovative & Smart Education (WISE Program)

The WISE Program, which is hosted by the Ministry of Education, Culture, Sports, Science and Technology of Japan, fosters outstanding personnel with a doctoral degree who will lead various sectors by serving as researchers propelling global scientific research, corporate executives leading innovations, entrepreneurs driving social implementation of new knowledge, and professionals formulating policy in the public sectors of Japan and other countries. The Program promotes reformation of graduate schools as a whole by creating research hubs capable of sustainably developing new joint research projects arising from the interactions of such excellent personnel. Each selected university implements the Program as a five-year integrated graduate school curriculum that unites the world's highest education and research capabilities by promoting institutional cooperation with extraordinary external players such as the world's top universities and private companies.

The following map shows the universities selected for the WISE Program:



Message From The President

The world envisioned by the WISE Program to foster AI Professionals for Marine Industries

The program was selected in AY2019 by the Ministry of Education, Culture, Sports, Science and Technology (MEXT) as a WISE (World-leading Innovative & Smart Education) Program. The program fosters "AI professionals for marine industries." These professionals will lead the development and evaluation of AI and social implementation in marine industries.

"AI professionals for marine industries" with skills of big data analysis and machine learning technologies as literacy can accurately utilize AI based on specialized knowledge of marine industries, maritime affairs, fishery, and abundant experience in the fields provided by the University. They are innovators for social implementation, highly specialized engineers, and marine policy makers. Due to concerns of decreased labor in marine industries, the talent fostered in the program will play critical roles in the realization of Society 5.0 and sustainable development goals (SDGs). By creating diverse values and systems, they will establish Japan's strong marine presence on the world's stage. To build the program's foundational education, we founded MAIDEC (Marine AI Development and Evaluation Center) in the campus, which houses high-performance computers. We also launched "Marine AI Consortium" in collaboration with industry-academia-government partner institutions. Marine AI Consortium forms an excellent hub devoted to educating talent, promoting interactions and communications, and producing new joint research projects. I hope that many of you choose to participate in the program.



Iseki Toshio
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Marine AI

Voices from the Ocean

Tokyo University of Marine Science and Technology
 Development of WISE Program to foster
 AI Professionals for Marine Industries



Marine AI Innovator

Development of WISE(World-leading Innovative & Smart Education) Program to foster AI(Artificial Intelligence) Professionals for Marine Industries

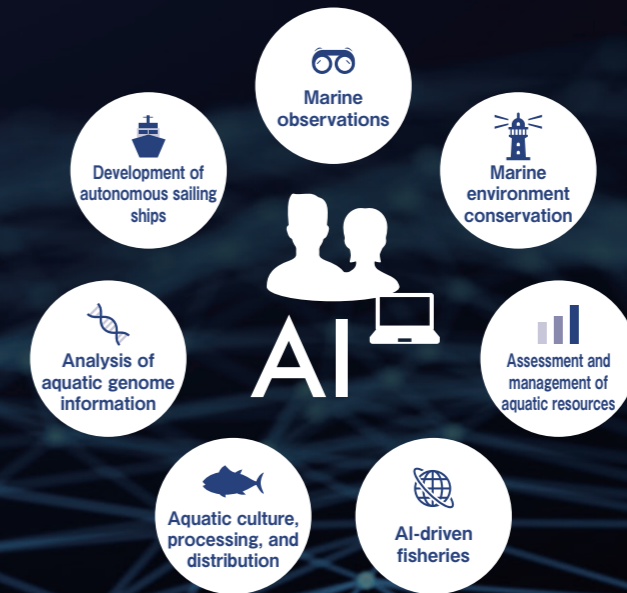
The sea is mother to us all and always embraces us.

To know, protect, and utilize the sea is the mission of humankind, and deepening this mission leads to the development of the world and consequently, the universe.

Tokyo University of Marine Science and Technology (TUMSAT), which is a forerunner in marine research, launched the Doctoral Program for World-leading Innovative & Smart Education (WISE Program) for the Development of AI Professionals in the Marine Industry in 2019 for cutting-edge education and research.

We foster marine AI innovators who will lead the social implementation of AI by introducing education on big data and AI based on outstanding marine knowledge.

What will the future hold, led by such innovators, for humankind?



Project to foster personnel who will play extensive roles in the future through the educational program specializing in marine AI

What are AI professionals for marine industries?

Innovators and highly skilled experts who are literate in big data (BD) analysis and machine learning (ML) and are capable of assessing AI performance, leading the social implementation of AI, or developing marine-related policies based on expertise and field experiences they gained at TUMSAT.

Development of AI professionals for marine industries.

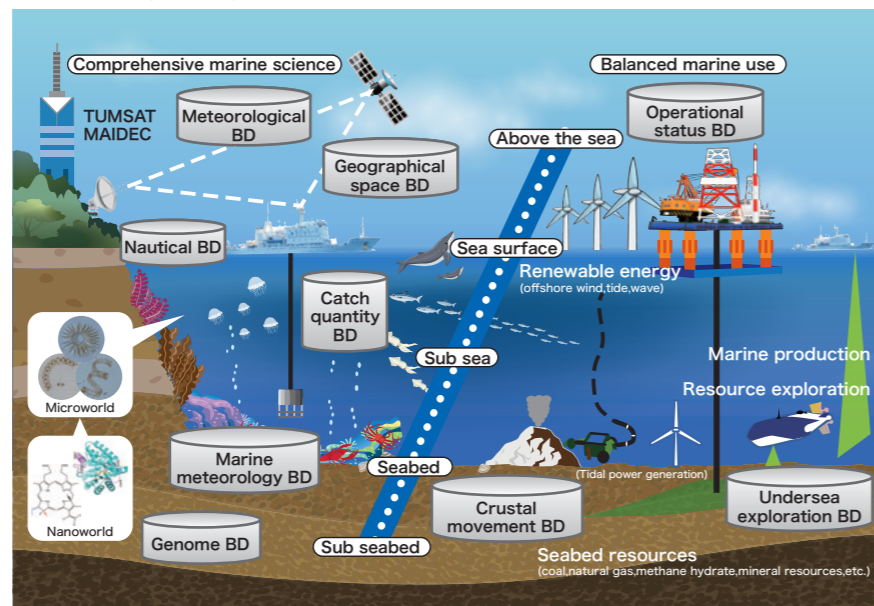
The WISE Program is established as a 5-year integrated graduate school course at TUMSAT.

The master's program provided lectures on BD analysis and ML to develop students' technical literacy, while practical skills beyond the courses are gained at MAIDEC. At the end of the master's program, students' basic ability to conduct doctoral dissertation research is assessed (Qualifying Exam). Through these efforts, we strive to develop specialists who can implement their knowledge and expertise gained at graduate school.

The doctoral program provides two introductory courses on AI and society. Since AI is expected to be highly reliable, the Course on Advanced Reliability Assessments focuses on performance evaluation methods for AI. The Course on Social Implementation Impacts Assessment discusses the impact of AI on society. In addition, the doctoral program cultures students' capabilities necessary to lead the social implementation of AI by providing opportunities to participate in real business projects at partner institutes (in-residence projects) and fieldwork.

Education and research system to sustain excellence

- Organizations and internal resources for education: On November 1, 2019, we established the Marine AI Development and Evaluation Center (MAIDEC) to fully utilize state-of-the-art nautical training vessels such as Shinyo-Maru, which is a strength of TUMSAT, the Field Science Center, and advanced navigation systems.
- Organizational personnel development under internal and external partnerships: teachers sent from and resident students sent to national research institutes and private enterprises.
- Financial support for students producing excellent results from the education/research support fund.
- Assurance of educational quality: The program is ensured through the IR-driven PDCA cycle and external evaluation. AI training on marine industries for teachers and teacher qualification system has been introduced into the Program.
- Research that highlights practical sciences to help create new industries by integrating BD from air to sub-seabed through industry-government-academia collaborations.
- Establishment of a five-year integrated graduate school course: Course of Marine Industry Data Science (tentative name, will be launched in 2026)



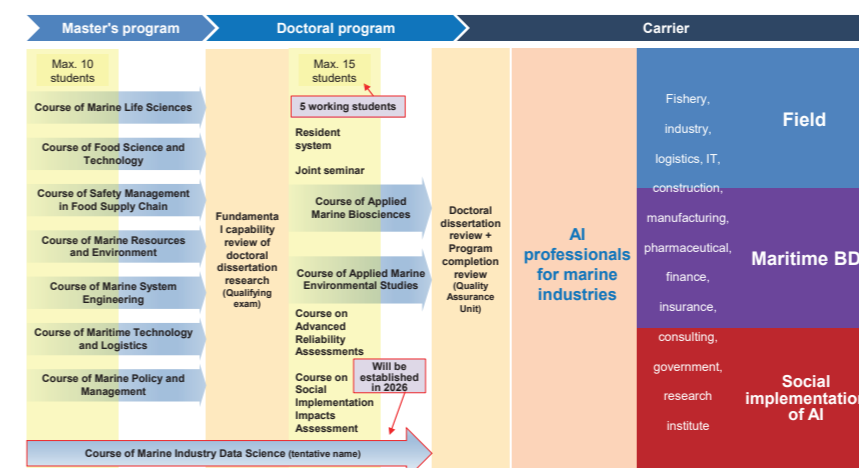
Relationships between this program and courses, partner education and other institutes

Development of WISE Program to foster AI Professionals for Marine Industries was adopted " WISE Program (Doctoral Program for World-leading Innovative & Smart Education)" in 2019.

On November 1, 2020, we established a marine AI consortium with partner institutes to advance the WISE Program via industry-academia-government collaboration TUMSAT has established an education and research system that spans wide-ranging fields such as marine, maritime, and fisheries. Students can learn about (1) the development of autonomous navigation vessels desired by the marine industry, (2) ocean observations using artificial satellites and Argo float data, (3) analysis of genomic information of aquatic organisms, (4) management of marine resources, and (5) establishment of next-generation smart fisheries.

In such a distinguished education and research system, WISE Program students aim to be advanced technical experts who can propose sophisticated solutions to complex challenges such as watch task automation of navigation officers, self-propelled vessels capable of automatic takeoff and landing, labor-savings in fishing and aquaculture using robots, and realization of high-production smart fisheries using automated and optimized water quality management based on weather forecasts and ocean information systems. Fostering AI experts in marine industry will improve our entire society by stabilizing the food supply while conserving natural resources and solving labor shortages. When social implementation of AI is realized, the achieved high valued services can be expanded overseas and contribute to Sustainable Development Goals (SDGs).

Overview of the WISE Program (Doctoral Program for World-leading Innovative & Smart Education) Course



Establish a multi-disciplinary education system

