

“Purpose of Establishment”

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1 Purpose and Necessity of Establishment of the Graduate University

1.1 Background

It was in June 2001 that Mr. Koji Omi, the then-Minister of State for Okinawa and Northern Territories Affairs and Science and Technology Policy announced the ambitious plan of establishing a new graduate university in Okinawa. To develop the project, a Study Committee met eight times under the chairmanship of Dr. Akito Arima, former President of the University of Tokyo. Three meetings of an International Advisory Committee were convened in rapid succession. Following the deliberations held at the meetings, then-Prime Minister Koizumi announced the government's firm commitment to the project at the 30th Anniversary of the Reversion of Okinawa in May 2002. Two months later, in July 2002, the project was placed as a main pillar of Okinawa promotion policies in the newly formulated Okinawa Promotion Plan.

To realize this project, the government took the following approach. It would first establish a research institute to initiate parts of the educational and research functions of the new graduate university. Thus, the Okinawa Institute of Science and Technology Promotion Corporation (President: Dr. Sydney Brenner) was established in September 2005, based on the consensus of ministers with an interest in the project (Chief Cabinet Secretary, Minister of State for Okinawa and Northern Territories Affairs, Minister of State for Science and Technology Policy, Minister of Finance, and Minister of Education, Culture, Sports, Science and Technology), which was achieved in December 2004, and the Diet's approval of the Independent Administrative Institution, Okinawa Institute of Science and Technology Promotion Corporation Act in March 2005.

The then-Prime Minister appointed a distinguished scientific board of Governors for the OIST PC, with Nobel Prize laureates comprising as many as half of the Board. The first meeting of the Board of Governors (BOG) was held in January 2006, and started to discuss the concrete plans for the project. In June 2008, the BOG created the Blueprint that summarized the basic concepts of and provided a framework for the new graduate university. The Blueprint stated that the objective is to conduct outstanding research and education in science and technology. By this means the graduate university aims to contribute to the sustainable development of Okinawa, to the advancement of science and technology in Japan and the rest of the world, and to the benefit of society in general. Meanwhile, OIST P.C. appointed researchers and held International Symposia, Workshops, and continued the research projects that had begun as a preceding project of the initiative before the establishment of OIST P.C.

Along with the progress of research and educational activities of OIST P.C, the government decided on substantive matters related to the operation of the University. It determined that the operation of the new graduate university should take the form of a school corporation, and that the government could provide necessary financial support to the project. Consequently, Okinawa Institute of Science and Technology School Corporation Act was submitted to the Diet in March 2009 and enacted on July 19, 2009. This legal foundation accelerated the preparation activities for the establishment of the Graduate University, with the clear objective of opening in 2012.

Specifically, in September 2009, most members of the BOG were appointed by then-Prime Minister as Establishing Members (**ATTACHMENT 1: List of Establishing Members**) whose mission was to prepare and take the necessary steps for the establishment of the University. The first Meeting of Establishing Members (MEM) took place in October 2009. Establishing Members held five meetings in total by February 2011, deliberating on the preparation of establishment of the Graduate University. Besides the meetings, each Establishing Member has been supportive and has contributed to the actualization of this project, with valuable guidance and advice for the recruitment of faculty and other activities involved in the establishment. For example, the selection of Dr. Jonathan Dorfan as the first President-elect of the University was one of the major contributions of Establishing Members.

Looking back on the development of OIST lands and facilities, Onna-son was selected among three candidate sites as a venue for the campus in April 2003. The first phase of the site preparation works commenced in March 2007, and construction of Laboratory 1 and the Center Building started in March 2008. The campus buildings began occupation in March 2010, which enabled both research and administrative staff to work integrally at the same site. The construction of Laboratory 2 commenced in September 2010.

To summarize the research and educational activities, OIST P.C as a Research Innovation Corporation has launched the initial research projects and prepared the research groundings of the new Graduate University. It has been recruiting excellent researchers domestically and internationally as Principal Investigators or Independent New Investigators, and as of August 2011 a total of 37 research units have started research projects in the fields of Neuroscience, Chemical and Molecular Sciences, Mathematical and Computational Biology, Environmental and Ecological Sciences, and Physical Sciences, and there has been steady growth in the number of journal articles with a good proportion of publications in higher impact journals (**ATTACHMENT 2**). OIST P.C. has continuously taken in young researchers such as post-doctoral fellows to be engaged in research activities in each unit. As of October 2010, the total number of the researchers is above 170 including 60 researchers from outside Japan.

In addition to the obvious fact that education is an intrinsic function of research activities in each unit, the successful OIST workshops, courses, and seminars held in the past prove that OIST P.C. has reinforced the educational function toward the transformation into a university. With participants from all over the world, young post-doctoral fellows, graduate and even undergraduate students, these academic events have become a valuable opportunity for young scientists to learn and to meet with and stimulate each other. (**ATTACHMENT 3: OIST International Workshops and Courses**).

In addition to these activities, OIST P.C. has been accepting visiting students and has provided educational opportunities through collaboration with allied universities such as the collaborative graduate program and placements with Nara Institute of Science and Technology (NAIST). This is also a clear indication of the educational function of OIST P.C. Students can be accepted into a research unit and receive research guidance as a graduate student research assistant for a period less than or more than six months. (**ATTACHMENT 4: Number of Supervision/co-supervision of Postgraduate Students at OIST**).

1.2 Purpose and Necessity of Establishment

1.2.1 Need for a Larger Pool of People Internationally Educated in Science and Technology

Today's science and technology is making rapid progress. It is important to be at the forefront of this progress. To remain technologically competitive in the global market, every nation must constantly improve its national educational and research systems. There is a growing need in Japan for a larger pool of people who are highly educated in science and technology¹. Such people are needed to contribute to the national research effort and open up new fields in research and in industry. To address this need, the aim of the Graduate University is to develop the full potential of its graduate students and post-docs toward scientific excellence and independence.

The world-leading research groups in science and technology have an international composition. Students undertaking higher education in science and technology should experience education and research in an international environment. To gain this experience they need to interact with research leaders from other countries. There is, therefore, a need for Japan to attract excellent researchers from overseas to participate as faculty in graduate education. There is also a need to attract excellent international students to Japan, and conversely, for doctoral graduates from Japan to be properly prepared for visiting and collaborating with other countries².

English is the recognized language of science and technology. It is the international language used by scientists and engineers from all countries for communication and for publication. The ability to communicate effectively in English is vital for researchers who will play important roles on the world stage. There is a need for a greater number of English-speaking high-level scientists in Japan, and for more Japanese doctoral graduates to spend time overseas in postdoctoral training³. Competency in English for scientific purposes is important to promote greater international mobility and collaboration for Japanese doctoral graduates.

Many of the rapidly emerging areas of science and technology are interdisciplinary, cutting across the artificial barriers created between fields of research in the past. People are needed to lead the development of these emerging areas. This requires greater exposure to different fields than schools organized along traditional discipline lines can normally provide. An interdisciplinary program is important to provide a scientific education that is broad as well as deep. OIST will encourage and nurture interdisciplinary education and research.

¹ The number of persons receiving doctoral degrees in science (per 1000 of the population) was four times higher in the United States and ten times higher in the United Kingdom than in Japan (US, 2004, 0.04; UK, 2005, 0.10; Japan, 2005, 0.01), Based on MEXT, "International comparison of Education Indexes, 2008 Edition, in Japanese.

² The number of foreign students studying at graduate schools in Japan is smaller than in the US and UK, and Japan also sends fewer students overseas than the US, Korea and China. Source: Report of Analysis on Graduate Education in Japan Project. Published by National Institute of Science and Technology Policy, MEXT in 2009 (p18).

³ Few Japanese students (2%) move overseas immediately after completion of a doctoral degree, although a high percentage of those with research experience in foreign institutions during their doctoral courses tends to move overseas immediately after completion. Report of Analysis on Graduate Education in Japan Project. Published by National Institute of Science and Technology Policy (NISTEP), MEXT in 2009 (p84).

The proposed intake is 20 students per year. The prospect of securing this number of excellent students is considered good. To recruit outstanding students we will focus particular effort on target student groups that are expected to have a high level of interest in our program, and in whom we are likely to have a high interest. Students acquainted with OIST workshops and participants of these workshops (researchers in top-level universities and research institutions) provide a potential contact network through which to reach possible candidates. We will also search for students who have won awards in university or international science competitions. We will take advantage of OIST Faculty members who are continually coming into contact with promising students and their supervisors in top-level universities and research institutions during their research dissemination activities and in collaborating laboratories. The experience gained from past and current educational programs sponsored by OIST P.C. provides strong indications that we will be successful in recruiting excellent students. One indicator is that the number of applicants for places at existing OIST International Workshops far exceeds the number of places available by about 7:1⁴, and the total number of applications per year is above 400. We have received positive feedback directly from students and faculty members in other universities during the international workshops, and road-shows that have been conducted since last fall. We have also received many enquiries (via email and telephone) from potential students who learnt about us from the activities. In addition, our mailing list that consists of the parties interested in OIST, has been steadily increasing, and the number of undergraduate and Master's students in the list is more than 100 as of August 2011. Assessing from such positive factors, we expect applicants at least five times more than the admission capacity from within Japan and internationally,

1.2.2 Need for a New Graduate University

It is not easy for established universities, especially those with undergraduate programs, to meet the needs described in 1.2.1. There are several reasons for this, as follows:

Established universities in Japan do not have a large proportion of foreign faculty members, researchers or students⁵. To attract the best in the world faculty members, research staff and students it is important to establish an international community and conditions for attracting international faculty, staff and students. It is difficult to achieve this within traditional universities with established culture and administrative systems. For example, the use of English as the official language of the university makes it easier for top-level scientists and students from any country to work and study. There is a need to establish international communities that will facilitate the recruitment of staff and students from any nation and provide opportunities to recruit the best in the world.

⁴ In 2010 there were 257 applications for 34 places in the *Quantitative Evolution Comparative Genomics* course, and 136 applications for 28 places in the *Okinawa Computational Neuroscience Course*.

⁵ The percentage of faculty members of foreign nationality in Japanese National Universities is 2.6%. "Report of the Survey of Scientific, Technological and Academic Activities in the Universities" (March 2009) made by National Institute of Science and Technology Policy.

It is difficult for traditional Japanese universities with undergraduate programs to conduct research and education in science and technology using English. It is therefore critical to Japan's international research success that a graduate university be established in science and technology in which the language of instruction is English. It is also important to establish English as the language of daily informal interaction among students and staff, because such interactions are vital for the process of scientific thought and discovery. The use of English in both formal and informal interaction is needed to increase the competency in English for scientific purposes of Japanese students. Competence in English for scientific purposes will increase opportunities for international collaboration, allow more extensive and faster access to the scientific literature, and increase the rates of publication in top-level journals. It will also widen the future career opportunities for the graduates.

Departmental structures create artificial boundaries that reduce collaboration and impede interdisciplinary research and teaching. It is difficult to dismantle such boundaries after they have been established. Departmental boundaries are reflected in the physical buildings, governance structures, and curriculum. To create a truly interdisciplinary program it is necessary to plan from the beginning and incorporate the interdisciplinary approach into the construction of the buildings and course designs. It is also necessary to recruit researchers able to work across the traditional boundaries between fields.

There are several examples of successful international graduate universities with the aims and organizational structure proposed. These are small institutions without undergraduate programs. They are also world-class research facilities with excellent reputations, and there is strong competition among prospective students for entry. A good example is Rockefeller University, which has a 50-year history of doctoral education and is very successful on an international basis with only 70 faculty members. Since its founding in 1901, 23 Nobel Laureates have been associated with Rockefeller University.

1.3 Basic Concepts / Objectives of Education and Research

1.3.1 Basic Concepts

The Graduate University will concentrate on research and graduate education in selected fields without needing to be a large comprehensive university with undergraduate students. This will allow the University to more effectively conduct integrative and innovative research and provide outstanding doctorate education. The following five central concepts will be the guiding principles of the operation of the Graduate University

- Best in the world
- International
- Flexible
- Global networking
- Collaboration with industry

The most important of these is to be the “best in the world”. The Graduate University will be a leading center for education and research that addresses new challenges in science and technology. To be the “best in the

world”, the Graduate University requires a culture where creativity, uniqueness and diversity are encouraged. It will apply these values when recruiting new faculty and when selecting students for admission.

The Graduate University will establish a fully “international” environment in terms of its staff and students, and the language of teaching and research. English will be the official language of instruction and operation, and the students will submit their thesis in English. More than half of the faculty members and students will be non-Japanese. Exposure of Japanese and non-Japanese students alike to such a diverse environment will foster a uniquely open and innovative way of looking at science.

To be “flexible” means to encourage innovation and creativity in research, to accommodate new initiatives, and to treat every student as a unique individual. Students will be encouraged to develop their own original ideas, but also to modify their ideas flexibly in light of new evidence. Students will be encouraged to become independent thinkers, which is necessary to facilitate the full realization of their scientific potential.

“Global networking” is essential to increase the visibility and reputation of the graduate university. This is important for attracting the best faculty and the best students internationally. It is also a way to facilitate the career pathway of its graduates through connections with excellent universities and research institutes worldwide.

“Collaboration with industry” is a broader aim that applies to the outcomes of the research undertaken at the graduate university. Advances in science and technology can be applied to the sustainable development of Okinawa, to the competitiveness of Japan in science and technology internationally, and to the benefit of society in general. Students will be encouraged to be aware of the importance of research outcomes to society. (ATTACHMENT 5)

1.3.2 Main Academic Fields of Education and Research

There will be a single graduate program allowing interdisciplinary research. A major advantage of the Graduate University is that it can develop an interdisciplinary program without traditional departmental boundaries, in part because it is being created without an undergraduate program. Increasingly, the problems facing the world are interdisciplinary in nature and require a new kind of approach to answer them. Few centers for such integrative research and education have been established so far, though demand for graduates who can operate effectively in this new mode of thinking is growing.

To be a truly world-class research center, a Graduate University of the projected size of OIST must concentrate its resources and efforts on selected areas while still offering comprehensive education across the necessary range of disciplines to effectively prepare students for such research. Such seemingly conflicting requirements for interdisciplinary graduate education demand a flexible approach.

The Graduate University will provide outstanding research training based on the following core disciplines:

- Biology
- Chemistry
- Computer and Information Sciences

- Mathematics
- Physics

The Graduate University will offer a single graduate program to facilitate and encourage interdisciplinary research. With appropriate guidance from an appointed advisor, students will assemble an individual program of the most suitable combination of specific courses and laboratory rotations necessary to prepare them to undertake their thesis research. The absence of departments or separate programs will allow the student to bring together expertise and knowledge across a broad range of disciplines and thereby to conduct truly interdisciplinary research.

1.4 Qualities that OIST seeks to develop in its Graduates and Expected Career Path of Graduates

1.4.1 Qualities that OIST seeks to develop in its graduates

The University aims to develop scientific excellence and independence in its graduates. Education will aim to prepare them for important roles in the international scientific community. It is expected that graduates will be excellent candidates for positions at internationally leading scientific institutions.

Graduates from our program should have the ability to think creatively, reason scientifically, and collaborate effectively across traditional boundaries. They should be able to find creative ways to solve problems that have not been solved before, and be able to adapt their way of thinking to changing circumstances, and to critically appraise, assimilate, and utilize information.

The ability to think flexibly will be enhanced by exposure to the different approaches taken by different disciplines. The ability to reason scientifically will be enhanced by courses that offer many opportunities for students to engage in collaborative discourse and scientific debate with instructors and peers⁶. Such interaction can improve student conceptual understanding and increase the capability for scientific reasoning⁷.

Students will be encouraged to formulate original scientific questions. Our courses will emphasize a critical understanding of original research papers. We will encourage independence in the design of research projects and interpretation and publication of results. Graduates should display the capacity for independent scientific achievement.

We also aim to develop in our students the ability to present and discuss their scientific work in English. This ability will enable them to present scientific papers at international meetings and increase the visibility of their work. It will increase their opportunities for employment. We will develop this ability by requiring use of English as the language of instruction and encouraging active participation in classroom and laboratory discussions.

⁶ Levin, R (2010) Top of the Class: The Rise of Asia's Universities. *Foreign Affairs* **89** (3) 63-75.

⁷ Osborne, J. (2010) Arguing to Learn in Science: The Role of Collaborative, Critical Discourse. *Science* **328**, 463-466.

1.4.2 Expected Career Path of Graduates

After graduation, our students are expected to obtain post-doctoral positions in internationally leading universities and research institutes in Japan and abroad. They should be well prepared and positioned to become leaders in scientific research. Networks among researchers that have been established through activities such as OIST International Workshops and faculty recruitment will facilitate placements. In addition, OIST has visiting and adjunct faculty who hold positions at other leading universities in Japan and overseas. These faculty members will help our graduate students to make personal contact with researchers at their home institutions, which will help to connect our students with employment opportunities.

The career path of graduates from similar institutions shows current trends. Rockefeller University and the Weizmann Institute in Israel have strong similarities to the proposed Graduate University. Most graduates continue to post-doctoral research positions⁸, and it is expected that the career paths of our graduates will follow similar lines.

However, as a natural outcome of the training at the university, a proportion of graduates may choose to take non-academic job opportunities. Thus, we intend to develop an efficient career support as described below.

1.4.3 Career Support for Students

The university will conduct following measures to support career development of students. Firstly, the career support will be implemented in our curriculum. The compulsory courses Professional Development I and II will comprise a series of seminars and workshops designed to prepare OIST graduates to function effectively and responsibly in their scientific career. Communication, media, and presentation techniques will be developed, including the tools to present and manage one's profile online and in person. Invited business persons and experts from industry and science will participate in this program and share their experience with students. This will help students to understand career prospects. Such interaction will also make our students visible to opinion leaders, which will contribute to future career of the students regardless of the places where they will be engaged in research activities.

General Advisor, Thesis Supervisor, and all the faculty members will be responsible for the career development of the students through overall education and research activities at the university. This applies to the students who choose a career in non-academic fields.

Secondly, we intend to develop other forms of career support in phases. As an initial step, the Student Affairs Section will provide information and hold events to help develop career pathways for students. In addition, by around the middle of academic year ending August 2015, we plan to create an office for "Career Advising" that will be in charge of collecting information on job opportunities and providing the students with them by using intranet and notice-boards, and to coordinate faculty mentoring and career counseling.

⁸ The Rockefeller University Alumni Association website states that, over the years 1959-2001, 75% of their graduates continued in academia, 6% followed careers in pharmaceutical and biotechnology companies, and the remaining 19% went on to find diverse employment in business, law, publishing, journalism and government bodies. Similarly, at the Weizmann Institute in Israel, approximately 90% of graduates describing their careers stated that they continued their studies in post-doctoral positions elsewhere.

To facilitate student job searches we will develop and maintain lists of internet sites on which jobs are collected together and posted so that students can search efficiently for opportunities. These information provider lists will be integrated into our communications networks for easy access. This will provide a place where students can view job advertisements from different places.

2 Names of the University, Graduate School, and Major, and Title of Degree

2.1 University Name

Pursuant to the provision of Article 2 of Okinawa Institute of Science and Technology School Corporation Act (Act No.76 of 2009), the name of the Graduate University will be Okinawa Institute of Science and Technology Graduate University. The words “Okinawa” and “Science and Technology” are used as parts of the name because the Graduate University is to be established to conduct internationally outstanding education and research in science and technology in Okinawa. Also, this is to succeed the name of its previous body Okinawa Institute of Science and Technology Promotion Corporation that has already been internationally recognized.

2.2 Major and Degree Awarded

The Graduate University will have a single graduate school (*Kenkyuka*) and a single major (*Senkou*) to encourage integrative, interdisciplinary research and education. These will be named the “Graduate School of Science and Technology” (*Kagakugijutsu-Kenkyuka* 科学技術研究科) and “Major of Science and Technology” (*Kagakugijutsu-Senkou* 科学技術専攻) because the subject of research and education of the Graduate University will be science and technology. All faculty will belong to this school, regardless of their research specialty.

3 Principles and Features of Curriculum Design

3.1 Basic Policy of Curriculum Design

In keeping with the concept of “best in the world” we will recruit outstanding students and conduct top class academic instruction. The academic program will aim to develop the full potential of each student toward scientific excellence and independence. In accordance with this aim, every student will be treated as a unique individual and have their program of studies tailored to their scientific aspirations, prior education, and current interests. The basic principles of the curriculum design are to facilitate independent scientific thinking, and to learn by doing research. There will be a single interdisciplinary program without barriers between laboratories.

The students will be accepted directly into an integrated doctoral program leading to a postdoctoral career path in leading research institutes and universities. The doctoral program will have a standard enrollment period of five years, and will follow a course-based study system. A three-term per year system will be used. The first two years will comprise a combination of laboratory rotations and courses, designed to prepare the students for their doctoral thesis work in a flexible way. In the second year the students will choose a laboratory in which to undertake thesis research and will submit a Thesis Proposal. After determination of readiness for thesis work the students will enter into a three-year period of thesis research, which will conclude with examination of the thesis.

Students entering the program directly from undergraduate studies will normally take about five years to complete their course of study. Those with a relevant Honors degree or a Master’s degree in another area can finish in four years. Students entering with a Master’s degree in the area they intend to specialize can finish in three years. A simplified model of the program is shown in Figure 1.

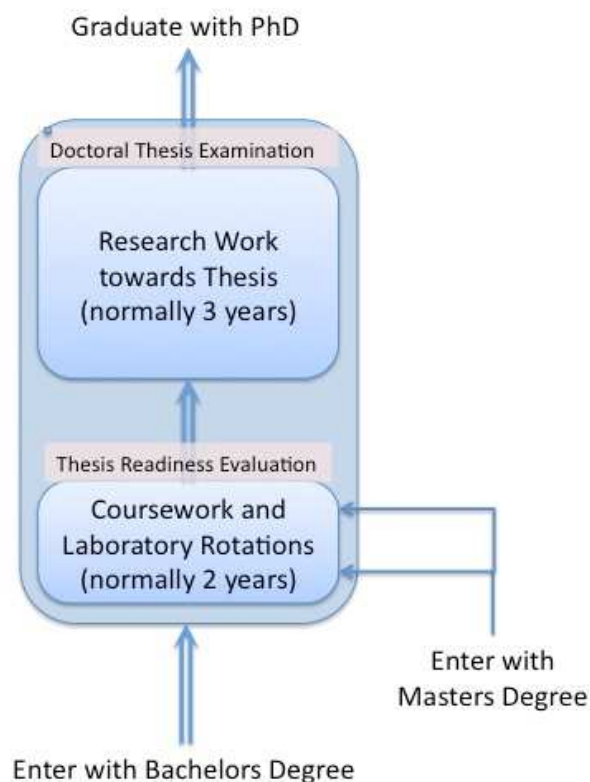


Figure 1: Model of Degree Program at the Graduate University

3.2 Structure of course categories

The course categories are: Professional Development, Basic, Advanced, and Laboratory courses. In the first two years of the program students will undertake an individualized study program constructed from a combination of these courses. Although the limit on the number of registered courses (Professional Development, Basic, and Advanced) is 4 courses per term, students will not normally take more than two Basic or Advanced Courses per term, in order to leave time for independent studies, reading, and laboratory work during rotations. ”

Each course will have a Course Coordinator, who will be the faculty member responsible for overseeing the content, teaching, and examination requirements of the course. Course Coordinators will have a deep knowledge of the area covered by the course syllabus. More than one faculty member may teach a course, and adjunct faculty members may contribute parts of a course or entire courses.

3.2.1 Mandatory Courses

To maintain flexibility in the curriculum the number of mandatory courses (apart from the laboratory courses: Rotation and Thesis Proposal) will be limited to two, each worth one credit. These courses are Professional Development I and II, detailed in the following section.

3.2.2 Professional Development Courses

Professional Development Courses are designed to develop essential knowledge, experience, and abilities for successful completion of the graduate program and to prepare the graduate for a career in leading international research laboratories. There are two compulsory courses and three optional courses. Optional courses are worth one credit each, but those points cannot be counted in the completion requirement for the degree.

Professional Development I is a mandatory course that will cover laboratory safety matters, scientific communications, and research ethics. It will be taught as an intensive course in Term 1. This course must be completed before the laboratory rotations because of safety and compliance requirements. This course is worth one credit.

Professional Development II is a mandatory course that will prepare the students to function effectively and responsibly in their scientific career. This will be conducted as a series of seminars with visiting lecturers from business and government organizations involved in science and technology, experts in the applications and commercialization of science, and experienced laboratory leaders and science communicators. It will cover material important for the future scientific career of the student and it will be taught during the thesis research period when students have had more experience of research. This course is worth one credit.

Laboratory Experience is an optional course for students who have no previous experience of working in a research laboratory, to provide an introduction to operating basic laboratory equipment, reagent handling, measurement and analysis, and laboratory methods. The value of the Rotations will be enhanced if students already have some experience in a laboratory situation. Some students will have degrees in subjects without laboratory requirements (such as mathematics and computer science) and they will be encouraged to take this course.

English for Higher Education in Science and Technology is an optional course for those students for whom English is a second language. A high level of proficiency in English will be essential for students to succeed in the graduate program, because the interactive tutorial-style program will require the students to participate actively in discussions and debate in English during the courses, laboratory rotations, and research guidance.

Essential Japanese for Foreign Researchers is an optional course for students from non-Japanese-speaking countries. This course aims to ensure competence in Japanese language and culture sufficient for safe and effective work in a laboratory in Japan. Since graduates of the program are expected to become leaders in science in the future, the development of an appreciation of Japanese culture among this group would have longer-term benefits for international understanding and cooperation in science and technology. It will also facilitate a career path in Japan for non-Japanese graduates.

3.2.3 Basic courses

Basic courses will be conducted in an interactive tutorial style at a level equivalent to Master's degree programs. A total of 11 Basic courses will be offered. These courses will provide grounding in core disciplines

such as Biology, Chemistry, Mathematics, and Physics, and preparation for advanced courses in more specialized fields. Basic courses are worth two credit points each.

3.2.4 Advanced courses

Advanced courses will be conducted in an interactive tutorial style. They will introduce the students to more advanced topics. These courses are subcategorized as Mathematics and Computational Sciences, Physical Sciences, Life Sciences and Interdisciplinary Topics.

Some Advanced courses will cover recent advances in specialized topics. For example, “Developmental Biology” will cover recent advances in developmental biology. Other Advanced courses will extend students’ knowledge to a more advanced level. For example, “Mathematics II” will introduce students to some more advanced mathematical topics based on a foundation provided in “Mathematics I”. These advanced courses are worth two credit points each.

Other Advanced courses are designed to provide more flexible learning. These are described under the subcategory of Interdisciplinary Topics. One example of these is “Independent Study”, in which students undertake a program of reading and synthesis of ideas. Under the supervision of an appropriate Professor, students will prepare a plan of study, carry out appropriate reading, describe the results of their study in a substantial report or essay and be able to answer questions from an audience of peers and faculty. Another example is “Special Topics”. It will be available to cover special topics, such as a topic or technique that is not regularly available as an advanced course. For instance, optogenetics is an emerging field that combines genetic engineering and optics, and one in which rapid advances are being made. Such a course may be given by full-time, adjunct or visiting faculty in response to the requirements of a specific group of students. These advanced courses are worth one credit point each.

In accordance with the principle of being strongly international, International Workshop Courses will be offered on an annual basis. These are short courses on specialized topics to which internationally distinguished visiting faculty contribute, and which accept international students on a competitive basis. Students in the OIST graduate program will be able to participate with approval from their General Advisor. These would normally be taken in years 3-5 of the program, to avoid schedule conflicts. However, in accordance with the principle of flexibility, the General Advisor may also approve International Workshop Participation by students during their 1st or 2nd year, when considered valuable for the student’s academic progress. Students can earn 1 credit for participating in International Workshops and completing course requirements.

3.2.5 Laboratory Courses

Laboratory courses include Rotations that are normally undertaken in the first year of the program, and the Thesis Proposal that is normally completed in the second year.

Rotations will form a major part of the student’s work in the first two years of the graduate program. In each Rotation the student will spend one term undertaking a specific project and will then move on to a different laboratory. The Rotations provide a variety of experience in different laboratories that will broaden the student’s understanding of different disciplines, techniques, and ways of thinking. They will also help the

student to select the most appropriate laboratory and research question for their thesis research. The General Adviser will guide the students to choose Rotations that include exposure to both experimental and theoretical approaches, and an interdisciplinary experience. The Dean will give final approval for the student's selection.

Students will typically complete three Rotations before deciding on a thesis topic. Each Rotation requires writing a project proposal, completing the proposed project in the laboratory, and submitting a written report. The Professor in charge of the laboratory will assign the project topic, taking into account the interests of the student and the capabilities of the laboratory. Students will be required to write a report including a literature review of publishable standard, a results section reporting their original findings from working in the laboratory, and an oral presentation to the laboratory members.

In the second year the students will begin work on their Thesis Proposal in the Research Unit where they intend to conduct their thesis research. The Thesis Supervisor will provide research guidance and the students will undertake preliminary thesis work. The preliminary thesis work will include an in-depth literature review, a piece of independent research undertaken in the laboratory, and preparation of a Thesis Proposal. The independent research project is developed by the student, under the guidance of the Thesis Supervisor. The student should complete this piece of independent research using the methods available in the laboratory, and write it up. This may be used as preliminary evidence to support the Thesis Proposal but the student may also choose a different topic for the thesis. The Thesis Proposal, including the write-up of independent research, will form part of the assessment for progression to the thesis research.

The Thesis Proposal will thus be developed in three phases: phase 1, literature review; phase 2, independent research project, and phase 3, preparation of Thesis Proposal. These will normally be completed at the end of each term and submitted to the provisional Thesis Committee. The committee will give feedback and the student will make necessary revisions. The final assessment of the Thesis Proposal will be undertaken by the Dean as part of the evaluation for progression to thesis research.

3.2.6 Policy on design of mandatory, elective and optional courses

In keeping with the requirement for a flexible course structure, the number of required courses will be limited. There are two required courses of 1 point each. Each student will normally take at least 4 Basic courses of 2 points each, and 4 Advanced courses of 1 point or 2 points each. Mandatory courses have a value of 1 point each. International Workshop Participation may provide additional points. The subtotal of Professional Development, Basic, and Advanced courses amounts to courses with a value of 20 points. Three Laboratory Rotations are normally required, with a point value of 9 points. In addition, students are required to complete a Thesis Proposal with a point value of 1 point. The subtotal of Rotations and Thesis Proposal is 10 points. Altogether, students will be required to accrue at least 30 points. Optional courses have point value but those points cannot be counted in the completion requirement for the degree. Students with advanced standing may, with the approval of the Dean, obtain credit for graduate courses completed prior to admission.

3.3 Policy on design of order of study (target year)

3.3.1 Year 1

Students must complete the first Professional Development Course (Professional Development I) before commencing laboratory work, and this must be the first course taken in the program. Professional Development I will be presented as an intensive block course at the start of the first academic year. In Year 1 students would normally take Basic Courses and complete three Rotations. Students may take Advanced Courses in Year 1 if they are sufficiently well prepared, and may also take appropriate Professional Development courses. Students should complete their Rotations before proceeding to the Thesis Proposal. This will help the students to make an informed decision about the laboratory they choose for their thesis research by providing exposure to different laboratories. Optional courses (Laboratory Experience, English for Higher Education in Science and Technology, and Essential Japanese for Foreign Researchers) would normally be taken in year 1.

3.3.2 Year 2

During Year 2 students need to complete their preparation for thesis research work. Students would normally take Advanced Courses in Year 2 but additional Basic courses may be taken according to each student's needs. They would normally complete their Thesis Proposal in Year 2. The Dean will then review their progress and determine if the student is permitted to progress to thesis research. This will help the students by ensuring that they do not commence their thesis research before they are ready.

3.3.3 Years 3-5

The main focus of Years 3-5 will be thesis research. In addition the students are required to participate in Professional Development II, which they will complete as a series of seminars conducted in parallel with their thesis research. The students may optionally participate in Workshop Courses as appropriate.

In general, Basic Courses and Advanced courses will be completed in the first two years, and this will provide sufficient background for thesis research. Variations will be possible in exceptional cases with the approval of the Dean.

3.3.4 The basis for the three-term per year system

A three term per year schedule will be used, with 15 weeks in each term. This schedule was chosen in order to give enough time for completion of a meaningful project in each laboratory rotation.

3.4 The Academic Year

The school year begins in September, which is most common internationally. This will facilitate the entry of international students to the Graduate Program. The school year will be composed of three terms: First Term

from September 1 to December 31, Second Term from January 1 to April 30th of the following year, and Third Term from May 1 to August 31. In addition to Japanese national holidays there will be breaks of two weeks between First Term and Second Term and between Second and Third Term, with a four week break after Third Term as shown in Figure 2 (grey boxes).

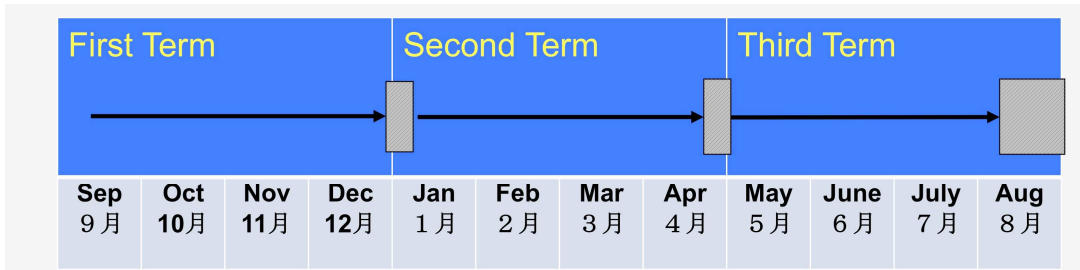


Figure 2: Planned Yearly Calendar

4 Concept and Features of Faculty Assignment

4.1 Composition of Faculty

Consistent with the principles outlined in the section on the “Purpose and Necessity of Establishment”, the graduate school will work toward “best in the world” status by appointing outstanding faculty members. The aim of being “international” will be achieved in part by ensuring that at least half of the faculty members are from outside Japan, and also by attracting faculty members with a strongly international experience and perspective. All faculty members will be expected to teach in English.

Faculty will be expected to maintain a program of excellent research and publication, to contribute to the Graduate University’s overall teaching program, to supervise graduate research projects and to assume appropriate responsibilities in the OIST academic community. The Faculty will be composed of Professors, Associate Professors and Assistant Professors⁹, following the international system of three ranks of professor.

In addition to the full-time faculty members, the total teaching staff will include adjunct and visiting faculty members, who will be outstanding, internationally renowned researchers able to make an important contribution to courses and research. Adjunct professors will generally have external appointments in other universities but will have laboratory resources at OIST and will spend significant amounts of time (up to 50% full-time equivalent) at OIST. See **ATTACHMENT 6** for a short CV of each Adjunct Professor at OIST. The contribution of adjunct faculty members will be by teaching parts of or whole courses, contributing to OIST international workshops, and participating in research. Adjunct faculty members will not be primary Thesis Supervisors but may serve on the Thesis Committees. Visiting professors may be invited to give specific lectures, teach whole courses or modules within a course, or contribute to OIST international workshops. Visiting professors will have shorter-term involvement and limited individual research support. Visiting professors will be internationally recognized researchers and inviting them to OIST will provide an opportunity for students to be exposed to a wider range of topics. The participation of visiting professors in the teaching program will build interconnections between OIST and other leading educational and research institutions and establish possible research collaborations. The overall ratio of faculty to students will be about 1:2 (when there are 100 students).

⁹ In the Japanese system a *Jokyô* (助教) has less independence and seniority than an Assistant Professor in the North American system. Although a *Jokyô* can give lectures he or she cannot be the sole supervisor of a PhD student. Also, for recruiting purposes the position of *Jokyô* as generally understood would not be as attractive as an Assistant Professor position in the US. Increasingly, Japanese universities use the rank of *Junkyôju* (准教授) for positions equivalent to Assistant Professor in the North American system. For official purposes we will use the title of *Junkyôju* (准教授), and create as subcategories the katakana titles of Assistant Professor (アシスタント プロフェッサー) and Associate Professor (アソシエート プロフェッサー).

4.2 Faculty Assignment

The Dean will assign faculty members to be Course Coordinators, and determine which faculty members contribute to each course. Faculty members may be Course Coordinators, in which case they will be responsible for overseeing the content, teaching, and examination requirements of the course. Faculty will be expected have a deep knowledge of the area covered by the course syllabus of the courses they coordinate. More than one faculty member may teach a course, and adjunct faculty members may contribute parts of a course.

4.3 Research Laboratories

The Research Laboratory will be the administrative unit for research at the Graduate University. All full-time Faculty members including Assistant Professors will be independent heads of Research Laboratories. The flat, non-hierarchical organization of Faculty and the absence of a departmental structure will encourage interaction among Research Laboratories and sharing of space, equipment, and expertise, which will promote interdisciplinary research activities. Research Laboratories may appoint Group Leaders, Post-Doctoral Researchers, Research Technicians or Research Assistants as fixed term employees. Administrative personnel will be appointed according to the administrative needs of the Research Laboratories, and may be shared between different Research Laboratories.

In reference to practices in overseas prestigious universities etc., the typical composition of each Research Laboratory is proposed in Table 1.

Table 1: Research Laboratory Personnel

Title	Individual Research Lab	Projected Total
Faculty Member (Professor, Associate Professor, Assistant Professor)	1	50
Group Leader	(Researcher)	
Researchers	2 - 5	100 - 200
Students	2 - 3	100 - 150
Research Technicians	1 - 2	50 - 100
Research Administrator	0 - 1	0 - 50
Total	6 - 12	300 - 550

The number of staff in each Research Laboratory may vary according to the research program. Each Faculty member (i.e., each Research Laboratory) will have about 2-5 researchers (including group leaders) and 2-3 students. Typically one or two Research Technicians will be appointed as research support staff for each Research Laboratory. The total personnel number for each Research Laboratory will be about 6-12 on the average. For the 50 Faculty, the research laboratories will have a total of around 500 persons.

4.4 Recruitment, Appointment, Promotion, Evaluation and Retirement of Faculty

Faculty members of the Graduate University are selected based on applying the highest international standards in the evaluation of candidates to ensure the recruitment of “best in the world” Faculty.

4.4.1 Strategies for recruiting “best in the world” faculty

The Graduate University will recruit “best in the world” faculty through open competition and strict review including external evaluation. To attract world-class researchers, the Graduate University will need to provide an excellent research environment. An important consideration is internal funding. Funding is provided for each Research Laboratory based on a budget proposal submitted annually, in accordance with the objectives of a 5-year research plan. Faculty members will also be encouraged to seek external funding. To attract world-class researchers, the Graduate University will also need to offer salaries, travel expenses, and other benefits that are at least competitive with top universities in other countries. Such benefits include high-quality housing offered at a low rent to faculty members. International awareness of OIST is increasing as evidenced by a large number of applications for faculty positions in response to a call for applications in 2010¹⁰.

4.4.2 Age Distribution of the Teaching Staff

The Graduate University recruiting policies will aim for a balance in the age distribution of the university Faculty. This will ensure that both new researchers and more established researchers will be represented among the Faculty. Form 3-3 describes the age distribution of the current members. OIST is an equal opportunity, affirmative action employer.

4.4.3 Appointment and Promotion

Faculty will be engaged in education and research as head of a Research Laboratory, having independent resources. They will be recruited through open competition and strict review. It is intended that these positions and ranks conform to similar ranks in the American system to allow simpler transfer of personnel between institutions, and to enhance recruitment at appropriate levels to maintain world-best standards of Faculty teaching and research.

There will be a tenure track system of Assistant Professor, Associate Professor and Professor. Appointments may be made at any of these levels. All promotions and renewals will be based on advice from an external review committee. Tenure carries with it a guarantee of employment until retirement. However, it does not guarantee continuous internal research support – tenured faculty will compete along with non-tenured members of Faculty for their internal research funding on a roughly 5-year cycle.

Assistant Professors are hired for 7 years with an evaluation by year 5, after which they may be promoted to a five-year appointment as Associate Professor with or without tenure, or terminated at the end of their term. Outstanding Assistant Professors may be promoted sooner.

¹⁰ In response to advertisements for new faculty in 2010, a total of 548 applications were received, of which 417 were from Non-Japanese applicants (OIST Academic Affairs Records).

Assistant Professor is an untenured position. The appointment to Associate Professor can be made either with or without tenure. In general, the position of Professor denotes tenure, although there may be some situations where this is not required, such as after the mandatory retirement age.

Associate Professor appointments will be reviewed for promotion to Professor during the 4th year of the initial 5-year appointment. Early review will be permitted in exceptional circumstances. If promotion is not granted, subsequent review will be considered only if there is a significant advancement in the Associate Professor's research achievements.

4.4.4 Evaluation

Faculty member evaluation will be based on the Faculty member's performance in research, education and service to the university. Evaluation of each Faculty member will be conducted with the assistance of a committee of outside experts in the relevant research field. Relevant personnel of the university may be asked to comment on the performance of the Faculty member in university service. Industrial collaboration activities such as patents and licensing can be one of the criteria included in the research performance evaluation to supplement academic publications. Tenure decisions will be made through a similar evaluation process.

4.4.5 Retirement

The retirement age of Faculty members will be 70 years (See **ATTACHMENT 7**: Excerpt from employment regulations for permanent employees). This permits the retention of active researchers who have achieved eminence in their field and continue to make a full contribution to teaching and research.

5 Educational Method, Course Selection Guidance, Research Guidance, and Completion Requirements

5.1 Educational Method

In accord with the overall aim of developing the full potential of each student toward scientific excellence and independence, every student is treated as a unique individual and their program of studies is tailored to their scientific aspirations, prior education, and current interests. The program is designed to facilitate independent, flexible and original scientific thinking, and to maximize research opportunities and time spent in direct research activities. The concept of “Best in the world” will be supported by careful selection of students and faculty, and use of adjunct and visiting faculty members to enhance the program.

In accordance with the concept of “International”, English will be the language of instruction and the educational program will be international with at least 50% of the faculty members and students from outside Japan. The teaching method will require active learning and classes will be conducted in the style of interactive seminars. This will be possible because of the small group sizes that can be achieved due to a high staff to student ratio. In accordance with the principle of “Flexible”, the particular selection of courses taken by any student will be based on their educational background, intentions, and experience, under the guidance of a General Advisor and with the approval of the Dean.

The graduate program emphasizes the importance of laboratory-based training and interaction with other students, researchers and professors. Beside-the-bench discussions, laboratory meetings, and informal interactions with people from research groups beyond the immediate focus of the thesis studies will be facilitated by Laboratory Rotations, each lasting one term (15 weeks). Laboratory rotations will be designed to meet the needs of each individual student.

5.2 Course Selection Guidance

5.2.1 Systematic curriculum design for each student

An unrestricted curriculum is proposed that will provide maximal flexibility in subject choice. Students will have an individualized study program to accommodate their unique academic background and research intentions. The students will have opportunities to broaden their education by taking courses in areas of interest, while also being guided to take courses in the core subjects necessary for a strong foundation in the disciplines important for their research. A systematic curriculum design for each student will be achieved by matching their program of study to their unique and specific educational needs and research aspirations.

A flexible curriculum design tailored to individual student requirements is important for several reasons: (i) students will be accepted from many different educational systems from around the world and will enter with different educational backgrounds (ii) interdisciplinary research may require crossing over into new disciplines for which students may need additional preparation; and (iii) students who are exceptionally well-prepared to do research will have the option of a faster track. In accordance with the aim of developing the full potential and independence of each student, students will not be assigned to continue in the laboratory of a

particular professor at an early stage, but will be able to choose the laboratory for their thesis work on the basis of Rotations in several laboratories.

5.2.2 Assignment of General Advisor for each student

The flexibility provided in the curriculum necessitates careful advising to ensure that course design is optimized. To achieve this, on admission each student will be assigned a General Advisor by the Dean. The General Advisor will work carefully with the student to help select courses and laboratory rotations that reinforce the necessary foundations in the core disciplines of relevance to their research. The General Advisor will also encourage course selection that The General Advisor is an experienced member of the faculty with a high level of competence in the field, able to give advice to the student on the choice of courses that will provide the breadth of knowledge necessary for successful interdisciplinary research. The General Advisor shall not become the Thesis Supervisor, and is required to be a disinterested party charged with taking care of the best interests of the student. The General Advisor will continue to play a general mentoring role for the duration of the student's studies at OIST.

The General Advisor and student together will formulate a plan of courses and Rotations for the first two years. The particular selection of courses taken by any student is based on their educational background, intentions, and experience. The course plan will take into account any previously established credits, specific experience and research interests of the student. Each individual's course plan will be finally approved by the Dean with advice from the Dean's committee. The Dean's committee includes faculty members to advise on those matters requiring academic input in specific subject areas, as well as senior faculty with appropriate experience. After the Dean has approved the course plan, the General Advisor under the authority of the Dean will monitor progress. The grades obtained in courses will be reported to the General Advisor and Dean's committee. The student's progress and performance in each laboratory rotation will be discussed in the Dean's committee to ensure cooperation among faculty members in facilitating individual student progress. This committee will advise the Dean regarding approval of the students move from one lab to another. It will be the responsibility of the Dean and General advisor to convene meetings of the committee and prepare an agenda to ensure that progress of all students is monitored.

5.2.3 General features of course plan

Course work in the first two years will provide a broad basis for further research towards a thesis in later years. Students will generally take at least four Basic courses in Year 1 and four Advanced courses in Year 2. Most courses will be worth two points each. In addition, the student will take two mandatory courses (Professional Development I and II) worth one point each. This gives a subtotal of 20 points. The emphasis on learning by doing research, and on interaction with other students, researchers and professors, requires that the student can spend enough time in the research environment. Therefore the number of courses that can be taken in a term is normally limited to four. A student should undertake Rotations in 3 laboratories before choosing their thesis

project. Lab Rotations will be worth 9 credit points. An additional 1 credit will be awarded for the Thesis Proposal. This gives a subtotal of 10 points, making a grand total of 30 points. Additional Workshop Courses held by OIST may be offered for credit to students in Years 3-5.

Some variation on the basic program is expected. Students may be given credit for courses and laboratory work completed at another university. For example, a student who has completed an MSc in a relevant area may not need to take courses for credits in terms of completion requirement. Students who demonstrate exceptional ability in the first year of study may be allowed to take on additional workload and thus undergo thesis readiness evaluation earlier, at the recommendation of their General Advisor and at the discretion of the Dean. On an individual basis, students may be permitted to take courses at other universities. However, as this may interfere with the laboratory rotations the number of such courses will be limited and the Dean must approve each application.

See **Form 2-2-1** for curriculum design, **Form 2-3-1** and the syllabi for the course overview, and **ATTACHMENT 8** for Individual Student Program Examples.

5.3 Research Guidance

5.3.1 Qualifying requirements

Before commencing thesis research, all OIST graduate students will be evaluated by an ad hoc thesis committee to determine if they are fully prepared for thesis research work. Assessment of readiness to progress to thesis research will be made after submission of the Thesis Proposal. Confirmation of progress to thesis research will be based on satisfactory performance in coursework and Rotations and acceptance of the student's thesis proposal. The Dean's committee will examine the student's record, which includes grades obtained in courses, and laboratory rotations, and the report from the thesis supervisor with any comments from members of the intended thesis committee. The Dean's committee will deliberate on the readiness of the student to progress to thesis work taking into account the completed program of study and the student's achievements (grades), in relation to the proposed thesis research. The Dean's committee may approve or decline progression. If necessary the Dean's committee may recommend additional course work, or the student may be judged unable to progress to PhD thesis research. Only students demonstrating satisfactory performance will have their progress to thesis research confirmed. After confirmation they may begin their thesis research.

5.3.2 Approval of Thesis Proposal, Thesis Supervisor, and Thesis Committee

The student proposes a Thesis Supervisor and submits a Thesis Proposal to the Dean. If the proposed Thesis Supervisor is the same person as the General Advisor, a new General Advisor will be appointed by the Dean to avoid any conflict of interest. All students will be required to have a Thesis Committee - irrespective of the seniority of the Thesis Supervisor - to provide oversight of the thesis research supervision. The Thesis

Committee will be appointed by the Dean and will comprise the Thesis Supervisor (or co-supervisors if there is more than one supervisor), the General Advisor, and another faculty member selected by the Dean in consultation with the student and Thesis Supervisor. The Thesis Proposal, Thesis Supervisor, and Thesis Committee must be formally approved by the Dean before the student can continue to thesis research.

5.3.3 Monitoring the Student's Progress

In the first two years, before confirmation of the student to progress to thesis research, the General Advisor will meet regularly with the student to discuss progress or problems with courses and laboratory rotations and will organize help and support for the individual student as needed. In years 3-5 the guidance of the student will be the responsibility of the Thesis Supervisor, Thesis Committee, and Dean. The Thesis Committee includes the former General Advisor as well as additional third party members who can provide an independent viewpoint on the student's research progress. At a minimum the Thesis Committee will include three members (Thesis Supervisor, General Advisor, and an additional committee member). In practice the committee may be larger especially in cases of co-supervision or highly interdisciplinary research requiring expertise from different disciplines. This committee will provide support and guidance from a third party perspective able to take a broad view and maintain standards across the university.

The Thesis Supervisor will take primary responsibility for monitoring progress of the student, assisted by the Thesis Committee. The Thesis Committee will meet at least once a year with the student, who will report on progress and future plans. The committee will have a supportive role and will include a member with relevant expertise, a member with substantial experience in thesis supervision, and the General Advisor as a student advocate. The General Advisor will continue to act as a backup and an advisor who can act in a confidential manner in case of problems between the student and the Thesis Supervisor. The student and the Thesis Committee will report yearly to the Dean on progress with the student's thesis research. In case of lack of progress or poor quality of research, the Dean may intervene and suggest solutions. During the thesis years a compulsory course on Professional Development will operate with regular seminars and workshops throughout the program, and further develop the competencies and values that underpin a successful career in scientific research. The guidance process is summarized in Figure 3.

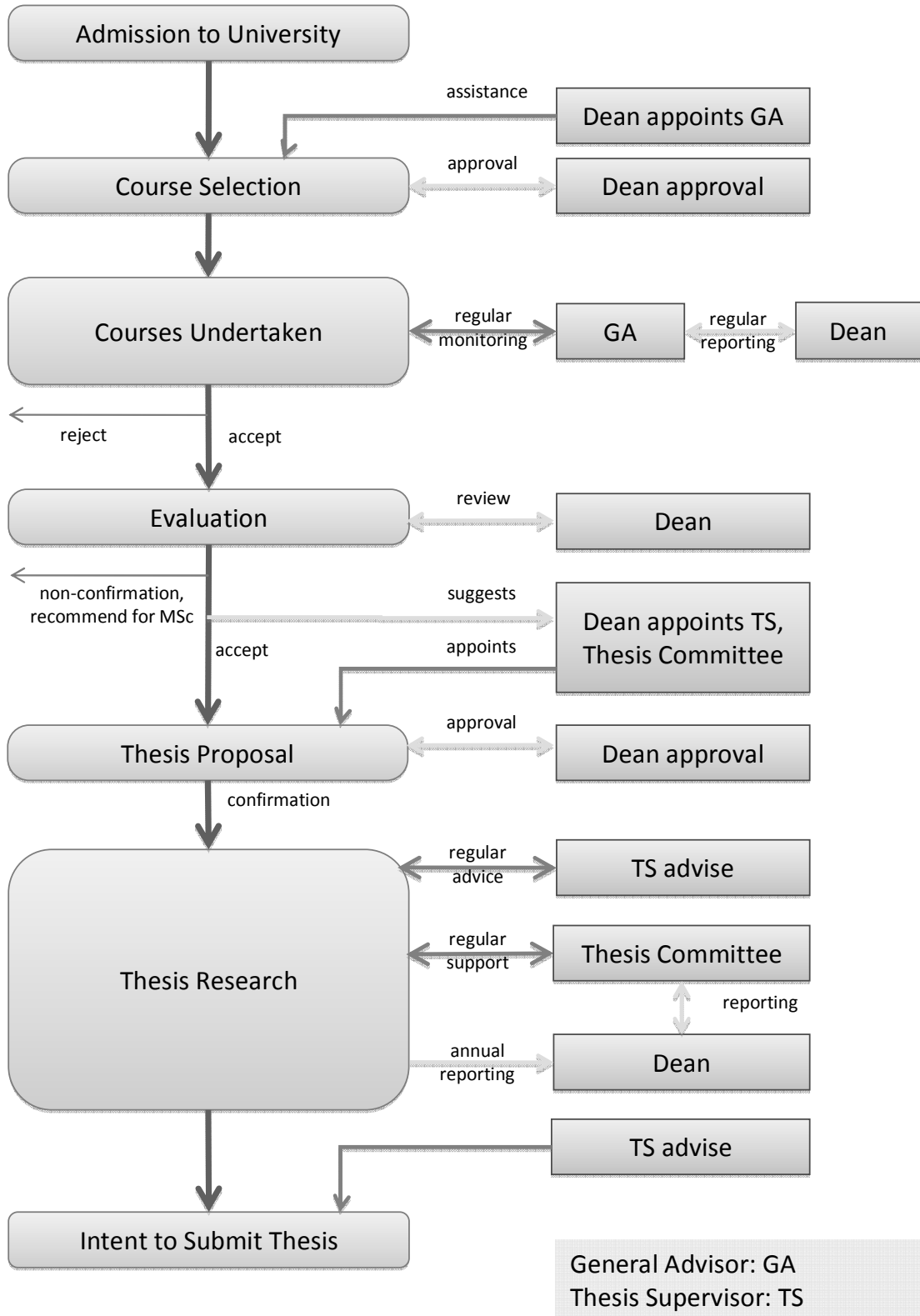


Figure 3. Student guidance process

5.4 Examination System and Publication Method of Thesis

Following completion of sufficient research, with the approval of the Thesis Committee, the student will notify the Dean of his or her intention to submit a thesis, allowing time for the appointment of examiners. The student will then submit a written thesis in English for examination.

The Dean (or ad hoc committees established by the Dean) will appoint thesis examiners from within and outside the University, taking account of the recommendations of the Thesis Committee. The examiners will be asked to read the thesis and then prepare an individual report in which they provide recommendations to the Dean regarding the acceptability of the thesis for a PhD (the options for advice will comprise 'accept', 'accept with revision', 'revise and resubmit', 'recommend the thesis be considered for a lesser degree', 'fail'). The student will be allowed to see the examiners' reports but not the names of the examiners once all examiners have reported to the Dean.

In the case of the PhD thesis examination process, an oral defense of the thesis will take place once the examiners recommend acceptance of the written thesis. Following a satisfactory oral defense and the satisfactory completion of required revisions, the degree may be awarded provided all other completion requirements have been met. The decision to award the degree is made by the President on the recommendation of the Dean.

The academic record for the student will record the name of the Thesis Supervisor and list separately the names of the members of the Thesis Committee. The process for examination of PhD theses is detailed in Figure 4.

The completed theses will be publicly available on the university's website.

Research ethics will be governed as described in Section 8, Management Structure for Academic issues.

5.5 Completion Requirements

A student must have successfully completed the following minimum requirements to be considered for the award of a PhD:

- at least 30 points (20 from courses, 10 from laboratory work),
- successful admission to the PhD research program,
- submission of a PhD thesis, which has been examined by external and internal examiners and found to meet the required standards,
- successful oral defense of the thesis.

A student who fails to meet requirements for the award of a PhD may be considered for the award of a lesser degree of MSc if they have successfully completed the following minimum requirements:

- at least 30 points (20 from courses, 10 from laboratory work),
- submission of a thesis describing their own research work at a level judged to be suitable for the award of MSc by a panel of external and internal examiners.

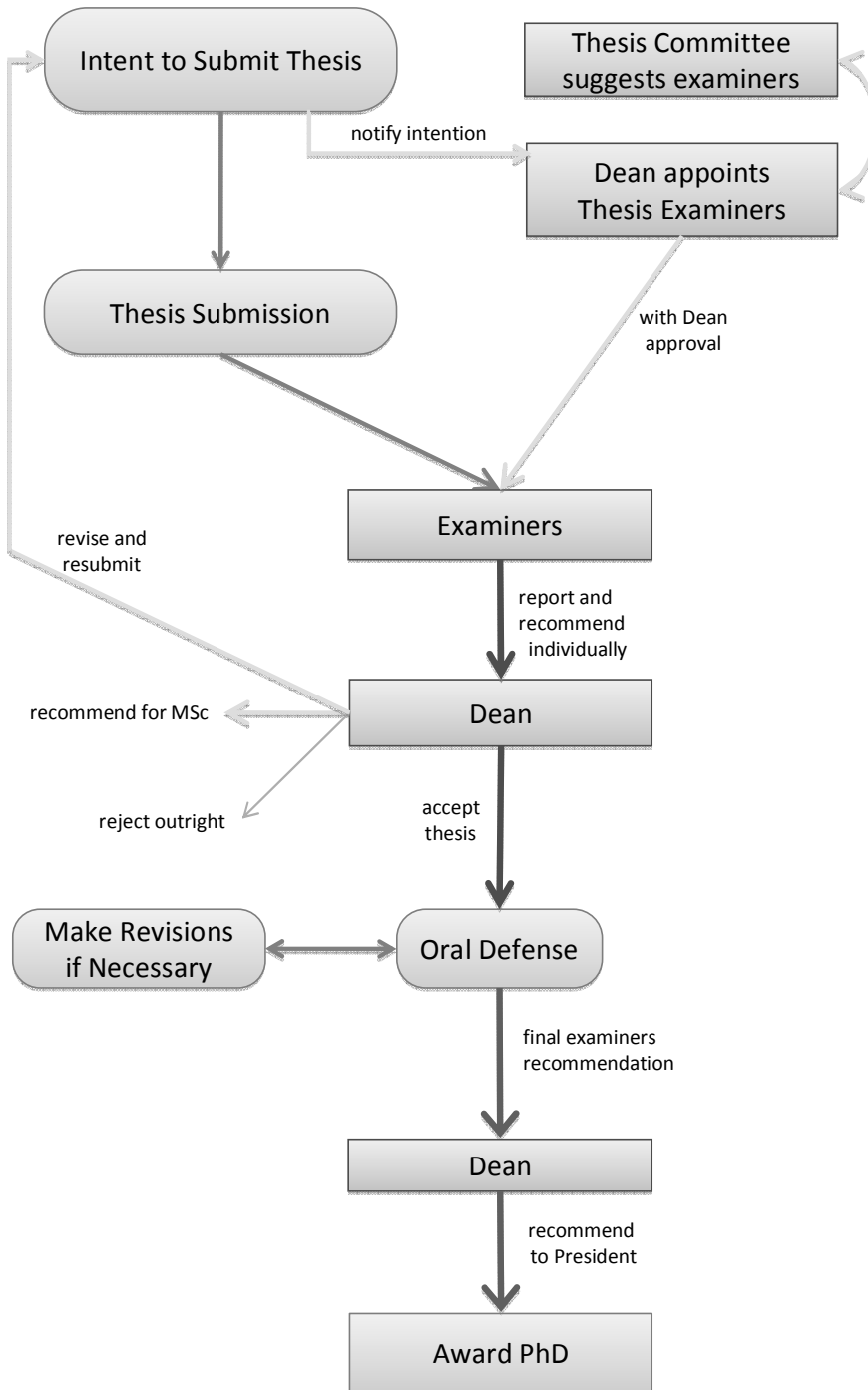


Figure 4: PhD Thesis Examination Process

6 Development Plan of Facilities and Equipment

6.1 Development Plan of School Lands

Campus development will be guided by the following three basic concepts:

- Cutting-edge technology and environmental harmony
- Interdisciplinary interactions
- Industry cooperation and networking

While cutting-edge technology will be central to the new campus, the campus will, as much as possible, be built in harmony with the rich natural environment on Okinawa, securing a symbiotic relationship between the campus and environment. The facilities are designed in such a way that interactions among researchers and students are encouraged to the maximum extent to foster interdisciplinary education and research. Facilities for international workshops and industry collaboration will facilitate the global networking of the Graduate University.

A total of 641,803.60 m² has been allocated from Onna-son to the OIST project. 696,914.91 m² of the Main Campus consists of the “Laboratory Zone” and the “Village Zone.” School buildings are built in the Laboratory Zone, and the Village Zone will consist mostly of residential facilities (housing, shops, auditorium, etc.) for students and researchers. A zone for industry-academia cooperation that will accommodate corporate research institutes and laboratories will be developed in the future.

The Seaside House and Seminar House, the facilities mainly used for international workshops and courses, are located in the Seaside Center 2 km away from the main campus. Additional research equipment such as DNA sequencing machines are located in Uruma research facilities rented from Okinawa Prefecture.

6.2 Development Plan of School Buildings and Facilities

6.2.1 School Buildings and Facilities

In the first stage of the campus development, four buildings are planned for laboratories and associated common facilities and administration in the Laboratory Zone. “Center Building” and “Lab 1 Building” have already been completed and have been in use since the end of FY2009. Construction of “Lab 2 Building” has commenced in October 2010, with a planned completion in Spring 2012. This Lab 2 Building will provide space for additional Research Units with provision for research in physics. The construction plan of Lab 3 Building will be developed as the need arises. The Auditorium in the Village Zone is under construction and will be completed by the opening of the Graduate University.

The Center Building will be the center of the interaction among students, researchers, and supporting staff. It holds major lecture rooms used for courses, Common Facilities such as library and health center, and offices for University management. Most lecture courses use the same room, Seminar Room 1 in the Center building.

Some computer-based courses and specific lectures will be held in Seminar Room 2, with internet and power supply for multiple computers. **ATTACHMENT 9** (Provisional Course Timetable and Classroom Schedule) shows that the time and venue of the courses are appropriate to the small size of the student population (20 students per year, 100 students in total) at the Graduate University.

Students will be spending most of their time in Lab Buildings for Lab courses and thesis research. Open Laboratories in these buildings are equipped with common/shared research facilities. This research environment encourages the interactions among students and researchers during their research activities. All students will be assigned to a research unit where the individual study space is provided with a desk and chair. Study Rooms will be also available as additional places to study, and several meetings rooms can be used for study group sessions. Student Lounges are located near the entrance and stairs where the traffic meets, which fosters the informal interactions among students and researchers. All full-time faculty members will be assigned an office of 19 m² in laboratory buildings. The office will be used for their individual research and guidance for students.

Table 2: Rooms (related to education and research)

Center Building	Lecture Hall (150 persons), 2 Seminar Rooms (60 persons each), Experiment/Practice Room, 4 Meeting Rooms (16-20 persons), Academic Affairs and Administrative Office, the President's office, Library, Media Center, Health Center, and Restaurant.
Lab1 Building	Open Laboratories, Seminar Room (60 persons), 5 Lecture Rooms (16-20 persons), 2 Study Rooms, 4 Student Lounges, and 20 Faculty Offices.
Lab2 Building	Open Laboratories, 5 Lecture Rooms (12-20 persons), 6 Student Lounges, and 16 Faculty Offices.

6.2.2 Equipment

Access to excellent laboratory facilities and advanced equipment is necessary for graduate student thesis research to be at the cutting edge. The newly completed laboratory buildings are state-of-the-art and there are excellent central research facilities including core facilities for genomics, electron microscopy, and high-performance computing. Individual laboratories are also well equipped for all research requirements. **ATTACHMENT 10** is a list of the shared major research equipment that will be available for use in student research. These conditions ensure that students will have the opportunity to realize their full potential in research under favorable funding conditions.

6.3 Development Plan of Library and Books

The OIST library will support the research and educational activities of OIST. The emphasis of the OIST library, as befits a modern scientific library, will be on instant electronic database access to appropriate

journals across the university, directly in the laboratories and workspaces. The physical space of the library will be a place for reading and reflection, for finding and accessing the latest information, and for thinking in an area distinct from the laboratory and office.

6.3.1 Library Services

The library will provide wireless and hard-wired Internet access to hundreds of online journals and information databases. The library will maintain a physical collection of required texts, essential reference publications and faculty-produced materials on a closed reserve system, and a selection of books that are only available or are most useful in print form. The library will also hold print copies of current major journals, scientific weeklies and review publications, and newspapers and science magazines in a variety of languages. Full time staff will be appointed to assist students and researchers. A “Library Committee” under the Faculty Council will oversee strategic direction of the library.

6.3.2 Searching the collection

A specialist senior librarian with expertise in modern information technology, scholarly publishing, copyright, and reference software will manage the library facility. Training will be provided to students and staff in modern informatics tools, database access methods, structured search methods, and the use of EndNote and Web of Science. In addition, course work will include specific teaching in these methods as part of our aim to prepare students for the knowledge economy.

6.3.3 Available material

The library will hold at startup more than 1,000 books, comprising textbooks, reference material and background material for teaching and research, and a variety of popular science, science philosophy, and general interest books for light reading and entertainment. The 59 printed journal titles available are shown in **ATTACHMENT 11**, and the book holdings can be seen as **ATTACHMENT 12**. OIST also has access to more than 200 online books, in a growing electronic book collection. The OIST library will dedicate at least 5% of the book collection for non-science and technology subjects in different languages for the use of staff and students. University-wide and remote access are available 24 hours a day to an extensive collection of more than 1700 electronic journals and databases, as listed in **ATTACHMENT 13**. This number of journals has been shown at OIST PC to be sufficient for our research needs, though the number of subscribed titles will grow as further research areas are added. Suitable additions to the library to support new directions of research that may arise have been included in budget plans.

6.3.4 Library cooperation

Cooperation with other technical and university libraries through NACSIS-CAT/ILL and PULC will facilitate access to materials not readily available at OIST, and will allow us to share our holdings with other libraries through these bodies. In addition, the library will act as a collaborative point for individual research laboratories' journal collections held in different research areas.

6.3.5 Library as a place

The library will have a combination of different seating styles and work areas to suit the differing needs of researchers and students. Students and staff will have desk-space and database access at many other locations in the University, so it is not intended that the library be able to accommodate all students simultaneously, nor that it be their primary working area. There will be approximately 10 comfortable chairs with laptop tables for contemplative quiet reading. Another 14 workstations with individual chairs and desks will provide work areas for more serious study with ready access to both the electronic journals and databases, and the reference texts in the library.

A small student meeting room next to the library equipped with movable furniture will allow flexible work arrangements and provide space for instruction in library-intensive tasks. Several rapid-access terminals will allow users to quickly search the local print collections, external databases, and interact with the university intranet and teaching computer system. An adjacent media center will provide a variety of printing, scanning, and photocopy services and ensure safe separation of noisy equipment from the library.

7 Admissions Policy

7.1 Admission Procedure

The Graduate University aims to train researchers who will play important roles in the international scientific community at leading scientific institutions in the public and private sectors. Accordingly, the Admissions Policy will make it a principle to recruit candidates with the potential and motivation to become leaders in scientific research on the international stage.

Recruitment will focus on attracting outstanding students from within Japan and internationally. Here “outstanding” means students who are highly motivated by the excitement and potential of the cutting edge research that is possible at OIST, who have the curiosity and academic ability needed to excel in their chosen areas of study, and who have the capacity for independent research and original thinking. Our students will also require proficiency in oral and written communication skills in English for advanced study in science, and the ability to interact effectively with people from a wide range of backgrounds.

About 20 students will be admitted per year. Students will be eligible to apply if they are expected to complete a BSc or equivalent degree within 12 months, or have previously completed a BSc, MSc or equivalent degree representing the completion of an undergraduate course in science and engineering, or exceptionally in other fields. The student should meet requirements for admission to a graduate school under the School Education Act. Those who hold a Masters degree may be exempted from some or all coursework as described above, with the approval of the Dean. Successful candidates will only be enrolled into a doctoral program.

The qualities that graduate university seeks in the students are not easily measured by standard examination scores because students can rote-learn for such exams and a high score does not indicate motivation to do research, curiosity, or capacity for independent research and original thinking.

To assess the required qualities we will take the admission processes as follows.

7.1.1 Overview of Admission Process

A. Application

Students submit an application for admission online. All documents are to be filled out in English. The following documents are required:

- i. Academic transcript and authenticated copies of diploma (BSc, MSc, etc.).
- ii. Statement (not more than 300 words) on “What I hope to gain from undertaking graduate studies at OIST”. This should address the candidate’s scientific interests and aspirations, and how OIST can help to fulfill them.
- iii. For students whose first language is not English, standard language test scores (TOEFL or IELTS) obtained within last 2 years. There is no minimum score required. (The minimum score is not set so that

students who are not fluent in English but meet the qualities will not lose the opportunity to enter our academic program.)

- iv. Optionally, evidence of academic ability such as GRE general test scores obtained within last 2 years.
- v. A minimum of two letters of recommendation from appropriate academic sponsors.

The application period is normally open from 1 August to 31 October.

B. Preselection

The Graduate Admissions Committee, appointed by the Dean, makes the selection of students for admission, and advises the President, who makes the final decision. The Committee membership includes the Dean, faculty members representing the major fields of research and education at OIST. The Provost is an ex-officio member of the Graduate Admissions Committee. This Committee reviews all material submitted by each student and makes a short-list of 30 applicants by the end of November. The 30 short-listed applicants are invited to a 5-day Student Admission Workshop at OIST, to be held in January each year.

C. Admission Workshop

The aims of the Student Admission Workshop are to:

- i. Conduct face-to-face interviews of candidates by the Graduate Admissions Committee or a subcommittee thereof. In the interview the Committee discusses with the student their aims and their motivation to undertake graduate studies at OIST. The panel will also discuss the student's academic record and career aspirations. The student will have an opportunity to ask questions about the graduate program.
- ii. Hold a short written examination of the candidates supervised by the Admissions Office. The purpose of the examination will be to provide a sample of the candidates' written work. Applicants are presented with two research articles that have different conclusions. They will be asked to write an essay of not more than 1000 words, in which they compare and contrast the articles. The articles will have non-specialized and relatively simple content and English. Candidates will have 3 hours to complete the assignment. Two markers will grade the test and the full text will be available to the selection panel.
- iii. Provide tours of OIST laboratory and student facilities, and the surrounding environs.
- iv. Provide a short scientific program of lectures including a plenary lecture by an Establishing Member of OIST.
- v. Provide a social program giving an opportunity for students to meet Faculty and other students.

D. Final Selection

The Graduate Admissions Committee will make a final selection of 20 students who will be offered a place in the graduate program, and advise the President. The President will make offers of a place, which the successful candidates will be required to accept or decline within 30 days. A ranked list of 10 reserves will be kept for a second round of offers to complete the aim of 20 confirmed acceptances.

7.1.2 Month of Admission

The Graduate University will accept graduate students for entrance in September in order to accommodate applications from both international students and Japanese students. Flexibility in time of entrance may be permitted by the President, for example when this would give advantages in recruitment of excellent students, or when this would be of benefit for the academic progress of the student. Details of the schedule for admission are given in **ATTACHMENT 14**.

7.1.3 Number of Students Admitted

In accordance with best-practice graduate teaching methods where low numbers of students for each faculty member are essential, and in line with overseas prestigious universities, the Graduate University will accept about 20 students per year at the 50-Faculty member stage, to maintain a total population of about 100 students (assuming approximately 2-3 graduate students per Faculty member, and a 5-year candidature). At least half of the students enrolled at the Graduate University are expected to be non-Japanese.

According to the University Rules and other regulations, Special Students and Elective Course Students will also be received as non-regular students. Special Students will not be awarded credits, while the Graduate University will award Elective Course Students credits. The number of Special Students and Elective Course Students will be kept small so as to assure the quality of instruction for regular students. We will set a maximum of 20 Special Students and Elective Course Students. Since they are present for less than 6 months, their total contribution to class size is not expected to exceed 10.

8 Management Structure for Academic Issues

The management structure of the OIST Graduate University is shown in Figure 5. The administrative home of the Faculty Members will be the office of the Provost (equivalent of Vice-President). The Vice-Provost for Research (equivalent of Deputy-Vice-President) will administer the research budgets for each faculty unit, and in addition, the key elements of the research enterprise such as common resources, shared equipment, grants, and research computing.

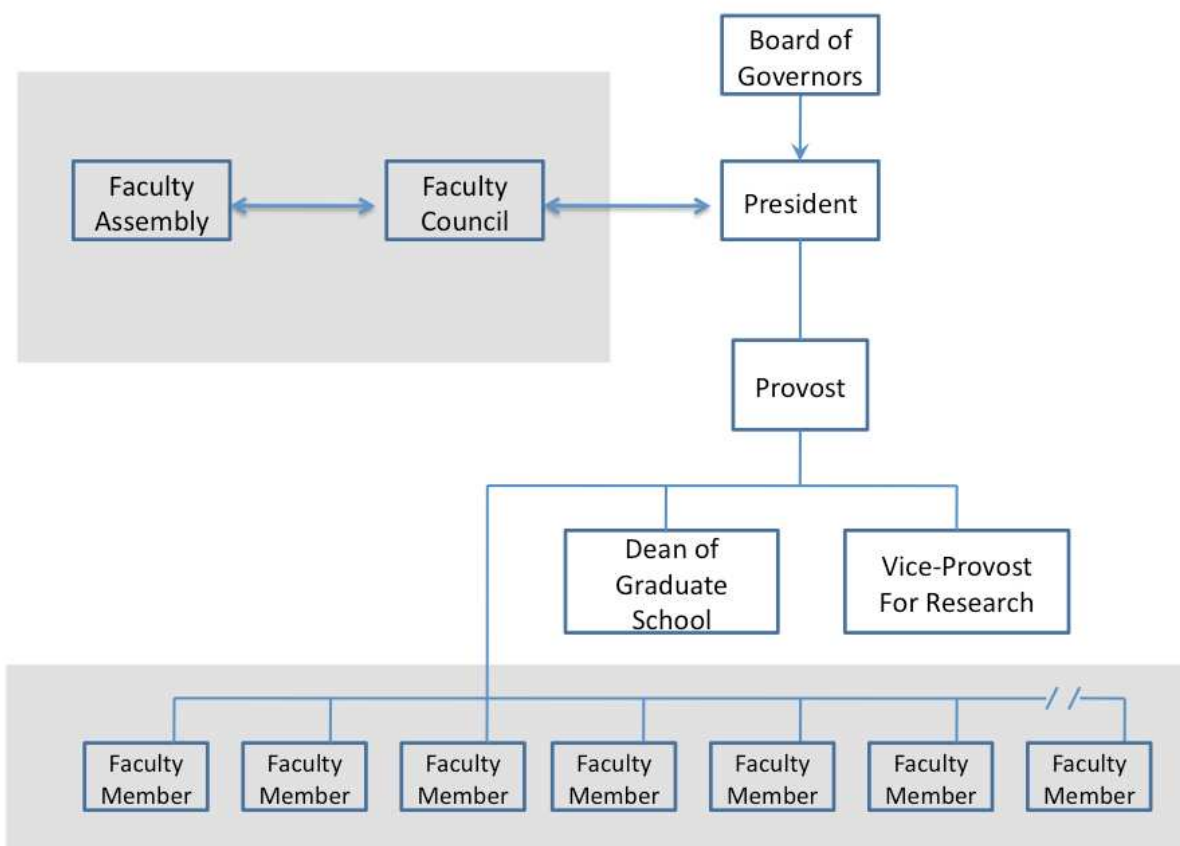


Figure 5. Management Structure for Academic Issues.

Faculty governance structures are shown in grey.

The administrative organization responsible for faculty governance and academic issues will be the Faculty Assembly (hereafter, Assembly). The Assembly will have an executive, the Faculty Council (hereafter, Council). The Assembly and Council are described in sections 8.1 and 8.2, respectively.

The OIST Graduate School will be administered by the Dean of the Graduate School. The position of Dean will be a rotating position of the faculty with a three-year term, which is renewable at the discretion of the President.

The Dean will manage the academic program, including the following matters:

1. Student recruitment and admissions
2. Curriculum and organization of courses
3. Student guidance and supervision
4. Career development
5. Award of degrees and graduation
6. International workshops, courses and seminars
7. Enrollment, re-enrollment, withdrawals, transfers, overseas study, leave of absence
8. Appraisals and sanctions of students
9. Evaluation of teaching
10. Other matters relating to education

As necessary, the Dean will appoint a committee, the Dean's committee, which includes faculty members to advise on those matters requiring academic input. For changes to the curriculum in a given area, the Dean will choose specific people to help in approving suggested modifications. The Dean will chair the committee.

A Senior Assistant to the Dean will administer the student-related functions including financial aid to students, student housing, student organization, student activities, student welfare, and student records. The position of Senior Assistant is an administrative, non-rotating position that will provide continuity in administration of the graduate school.

8.1 Faculty Assembly

8.1.1 Role of the Assembly

The Assembly is a self-governing body of the whole professoriate. The main purpose of the Assembly is to provide the faculty with information about university matters and serve as a forum for open discussion of university affairs with the President. The role of the Assembly is advisory to the President. The Assembly can bring issues that warrant the attention of the University management directly to the President. For operational efficiency the Assembly elects a sub-group, called the Council. The Council, under the leadership of the Chairperson of the Assembly, acts as the executive committee of the Assembly. The members of the faculty in addition have administrative duties on various committees, such as the Common Resources Advisory Committee, Animal Care and Use Committee, Research Ethics Committee, Biosafety Committee, and Gene Recombination Committee. These functions are services to the university; appointments to these committees are made by the President, Provost, Dean of the Graduate School, and Vice Provost for Research.

8.1.2 Membership of the Assembly

The membership of the Assembly includes all full-time professors, associate professors, and assistant professors. Adjunct faculty members may participate in Assembly meetings as non-voting members. Two student representatives (elected by the students), and two researcher representatives (elected by the post doctoral fellows and group leaders) may participate as in the Assembly, with speaking rights but without voting rights. The President, Provost, Dean of the Graduate School, and Vice Provost for Research may

participate as ex-officio members with speaking rights but without voting rights. The ex-officio members, student and research representatives attend the Assembly meetings at the invitation of the Chairperson and may be recused when the Chairperson deems necessary.

8.1.3 Chairperson and Deputy Chairperson of the Assembly

The Assembly has a Chairperson and a Deputy Chairperson. The Chairperson of the Assembly will be elected by secret ballot of the Assembly. Elections to the position of Chairperson will take place every two years. The term of office as Chairperson is two years. To provide continuity, the Chairperson-elect serves one year as Deputy Chairperson before taking office as Chairperson. The outgoing Chairperson serves one year as Deputy Chairperson.

The role of the Chairperson is to preside at meetings of the Assembly. The Deputy Chairperson will preside at meetings in the absence of the Chairperson. The Chairperson will set the dates of meetings. The agenda is set by the Chair of the Assembly but the President, Provost, Dean of the Graduate School, and Vice Provost for Research should always be consulted and be invited to the meeting. The Chairperson will represent the faculty as ex-officio member of OIST administrative committees as deemed necessary. The Chairperson will communicate the results of the deliberations of the Assembly and its subsidiary bodies to the appropriate members of the administration (President, Provost, Dean of the Graduate School, and Vice Provost for Research).

8.1.4 Frequency of convocation

The Chairperson will call meetings of the Assembly at least three times per year.

8.1.5 Items to be discussed at meetings of the Assembly

The Assembly will deliberate on policy matters, strategic direction and educational philosophy.

The Assembly may consider specific matters as follows:

1. Election of the Council
2. Admissions, withdrawals, transfers, overseas studies, leave of absence, and graduation of students
3. New research initiatives
4. Common resources and space
5. Faculty recruitment, promotions, and tenure
6. Staff welfare
7. Information technology and libraries
8. Formation of subcommittees
9. Reports on academic matters
10. Reports on other committees
11. Other matters

8.1.6 Procedures and Rules of the Assembly

The procedures and rules of the Assembly are separately stipulated in the OIST Faculty Assembly Rules.

8.2 Faculty Council

The Council is the elected body of the Assembly and its role is to provide advice to the President on academic and administrative matters. The agenda is set by the Chair of the Council, but the President, Provost, Dean of the Graduate School, and Vice Provost for Research should always be consulted and be invited to the meeting. Other members of the administration can be invited as need be. These meetings are critical for the running and the health of the institution at which the trust and cooperation between administration and faculty can be established and maintained. The Assembly devolves the responsibilities to deliberate specific matters to the Council. The membership of the Council includes 8 elected members of the Assembly (6 senior and 2 junior), 4 ex-officio members and 1 advisor, as follows:

Elected Members	Chair of the Assembly
	Deputy Chair of the Assembly
	Six elected members of the Assembly
Ex Officio Members	President
	Provost
	Dean of the Graduate School
	Vice-Provost for Research
Advisor	Director Finance & HR

The Council will meet monthly. Council minutes will be available to all Faculty members.

9 Self-Assessment [*Jiko-tenken-hyouka*]

9.1 Basic Policy

The Graduate University will conduct regular assessment in regards to the areas of education and research, organizational operation, facilities and equipment, and release the results to the public in order to improve its quality of education and research.

9.2 Method

Assessment will be conducted regularly, based on the criteria set in advance, in regards to the educational and research activities and the overall operation of the University.

9.3 Structure for Assessment and Evaluation

The Graduate University will have an ongoing internal procedure of periodic review and assessment by committees of experts from the best universities in the world. In addition to this internal assessment, an external evaluation will be conducted by a third-party evaluation organization accredited by the government.

9.4 Publication and Utilization of the Results

The Graduate University will summarize the results of the external evaluation as a report to the Board of Governors, which has the responsibility for disseminating appropriately. The Board will deliberate on the results and use them to improve the education, research, and management of the University. Such results will be made publicly available by means of the University's web site, publications, etc.

9.5 Major Evaluation Items

Major evaluation items are as follows:

- Purpose of the university
- Organization for education and research
- Faculty and supporting staff
- Student Admission
- The contents and methods of education
- Educational performance
- Student support
- Facilities and equipment
- System(s) to improve the quality of education
- Finance
- Management

10 Information Disclosure

10.1 Basic Policy and Method of Information Disclosure

The Graduate University will actively provide information on its educational activities by means of public website, publication, etc. in order to improve the quality of education and achieve its accountability as an educational organization for the public.

Based on the Supplementary Provisions of Okinawa Institute of Science and Technology School Corporation Act (Act No.76 of 2009), the Graduate University will formulate regulations in regards to information disclosure as a school corporation pursuant to the related acts concerning access to information held by incorporated administrative agencies, etc.

10.2 Information Disclosure Items

Information disclosure items are as follows:

- (1) Items related to the purpose of the education and research of the University
- (2) Items related to basic organization of education and research,
- (3) Items related to faculty organization, the number of faculty members, their degree and achievements.
- (4) Items related to admission policy, and the numbers of applicants, the number of students currently enrolled, the number of graduates, and the career path of the graduates.
- (5) Items related to courses, teaching methods, and the content of the courses, and the curriculum.
- (6) Items related to assessment of the student's performance and completion requirements.
- (7) Items related to the education and research environment, such as school lands, school buildings, facilities and equipment.
- (8) Items related to tuition, admission fee, and other expenses the University collects from the students.
- (9) Items related to student support regarding their career, mental and physical health, etc.
- (10) Other items such as university rules, the result of self-assessment and evaluation by third-party organizations, financial status of the university, etc.

The Graduate University will also provide information on its research achievement mainly by means of the Internet on a timely basis.

11 Strategy to Maintain and Improve the Qualifications of Teaching Staff (Faculty Development)

11.1 Basic Policy of Faculty Development

The Graduate University must maintain and improve the quality of its Faculty in order to provide an outstanding education at OIST and to meet the different educational needs of each student. The Faculty Development section of the Dean's Office will play an active role in the development of faculty members by implementing programs for faculty development in teaching and supervision of graduate students.

11.2 Methods

Specifically, the Graduate University will conduct the following:

11.2.1 Teaching Guidelines

The Faculty Development section of the Dean's Office will create, maintain and distribute guidelines for quality teaching to ensure uniform best-practice teaching standards are observed at OIST.

11.2.2 Student Teaching Evaluations

Students will evaluate each course at the end of the course. The results of such evaluations will be distributed to the teacher, and will also be available to students. The student responses to a standard subset of questions will be reported to the Dean's Office. The Faculty Development section of the Dean's Office will assist the teacher to respond appropriately to this feedback.

11.2.3 Peer Review of Teaching

Faculty members will support the development of their colleagues by participating from time to time as classroom observers, with the agreement of the teacher. The date of such observation will be reported to the Dean's Office, and the observer will discuss their observations with the teacher in a collegial and supportive manner.

11.2.4 Teacher Training

The Faculty Development section will arrange training sessions, and workshops for faculty development from suitably qualified facilitators, in order to enhance the teaching ability of OIST Faculty members.

11.2.5 Mentoring

A mentoring system will be established so that faculty with less experience in teaching and thesis supervision can meet with more experienced faculty to receive advice and support. As a part of this system the Thesis Committee supervising each student will include junior and senior Faculty members to facilitate the transfer of skills relating to supervision of research.

The Faculty Development section will implement these methods to ensure the improvement of the education and research of the Graduate University.