

Program for Leading Graduate Schools

Graduate Course for System-inspired Leaders in Multidisciplinary Science

~System-inspired Leaders for Multidisciplinary Science (SiMS)~

Course Registration Guide

(2024)

Graduate Schools of Osaka Metropolitan University

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I. Graduate Course for System-inspired Leaders in Multidisciplinary Science (SiMS Program)

In today's ever-evolving global landscape, the demand for highly-educated researchers capable of exhibiting robust leadership qualities is on the rise. This necessity stems from our collective goal of enhancing industry competitiveness and fostering sustainable innovation. Osaka Prefecture University and Osaka City University have been chosen by the Ministry of Education, Culture, Sports, Science, and Technology to spearhead the "Program for Leading Graduate Schools." Our mission is clear: to nurture exceptional individuals poised to take on pivotal roles across academia, industry, and government worldwide. In alignment with this vision, we present the "Graduate Course for System-inspired Leaders in Multidisciplinary Science," a comprehensive five-year doctoral program meticulously crafted to cultivate visionary leaders with a global mindset primed for the industrial sphere.

I-1. Goal of this Program

To meet the growing imperative of industries striving for heightened competitiveness and the realization of a sustainable society through innovation, there is an escalating demand for doctoral researchers adept at demonstrating global leadership. The necessity for individuals capable of formulating multidisciplinary and cross-disciplinary strategies, free from the constraints of singular fields and encompassing social scientific perspectives, is becoming increasingly paramount. Within this esteemed graduate school program, our objective is to cultivate "System-inspired Leaders in Multidisciplinary Science." These leaders will possess the acumen to devise research strategies that foster innovation through the fusion of interdisciplinary creativity, a comprehensive understanding across various fields, and the profound integration of layers within their respective domains.

I-2. Objectives of this Program (Picture of Human Resources to be Nurtured)

Our objective is to nurture researchers who embody the following abilities and characteristics:

1. A robust academic foundation and the capability to lead within their area of expertise.
2. A comprehensive understanding of diverse academic domains, transcending specific specialized fields.
3. Proficiency in crafting research strategies derived from multidisciplinary and multilevel interdisciplinary concepts.
4. Ingenuity and the capacity to translate fundamental research into industrial innovation.
5. Leadership prowess and the aptitude to organize and guide diverse teams towards shared objectives.
6. Competence in managing and implementing R&D strategies effectively.
7. Proficiency in disseminating ideas widely and establishing a strong global presence within the academic community.

I-3. Curriculum Policy (Curriculum organization and implementation policy)

The five-year curriculum is meticulously structured to realize the objectives outlined by the "Graduate Course for System-inspired Leaders in Multidisciplinary Science." Through a blend of interdisciplinary approaches and collaboration between academia, industry, and government, we aim to cultivate researchers capable of conceiving new value through multidisciplinary ideas, spanning diverse fields, and applying a comprehensive perspective to societal challenges.

(1) The foundational literacy course in our curriculum offers a comprehensive education in the philosophy and ethics of science, equipping students with a broad understanding of social issues and value creation.

(2) Our interdisciplinary courses are tailored to nurture students' multidisciplinary research capabilities. Through interactions with researchers across various disciplines, students gain exposure to a wide array of fields.

(3) The ideation course, a cornerstone of our program, is designed to cultivate skills in "systems thinking" for holistic problem-solving, "design thinking" for innovative ideation, and "management skills" for comprehensive innovation development.

(4) The global course, delivered through a mix of lectures, research, and practical exercises, features instructors from diverse backgrounds, including foreign scholars and industry experts. This course addresses various challenges in the globalized industry, fostering students' ability to navigate and address complex issues.

(5) The entrepreneurship course empowers students to leverage the skills acquired in the preceding components to translate academic research and innovative ideas into tangible industrial innovations.

I-4. Policy for Verification of Learning Outcomes

Although the following content includes provisions that are not directly related to students, please read to understand how you will be evaluated and trained.

I. Grading Criteria

(1) Achievement goals will be established for each course based on the assessment and degree grant policy (diploma policy). Students will receive grades ranging from A+ to D according to their level of achievement, as outlined in Article 14 of the OMU Course Regulations. A standard of C or above is specified as the minimum level of achievement.

(2) All grade distributions will be compiled and reviewed each semester to enhance overall achievement.

(3) Grading will be conducted on an absolute scale, assessing the degree of achievement. Any biases will be investigated and rectified, except in small classes.

(4) Degree theses will be evaluated by the affiliated graduate school department.

II. Grading Methodology

(1) Grading will consider not only the results of final examinations but also the overall level of achievement, including reports, presentations, and attitudes. Attendance records will not factor into the grading.

(2) Specific evaluation methods will be determined by individual course instructors. Students will receive detailed syllabi outlining evaluation criteria and assessment components in advance.

Policy for verification of Training Outcomes

Criteria for Developmental Evaluation

(1) The evaluation will be carried out following the eligibility criteria outlined in the Leading Program Assessment (attached document).

(2) In accordance with the diploma policy of this program, specific "achievement goals" will be established for each training period, and students will be graded based on a rubric evaluation form reflecting their level of achievement. A passing grade is defined as 60% or higher, representing the specified level of achievement.

(3) All evaluation scores will be compiled to generate a grade distribution for each period, and the overall degree of achievement will be assessed with the aim of continuous improvement.

I-5. Diploma Policy (Assessment and Degree Grant Policy)

The overarching goals of our program are to contribute to the development of a sustainable society, foster cultural creation, and drive industrial innovation. Throughout this program, we provide education aligned with these objectives. To attain certification for a diploma, students must cultivate the following abilities alongside expertise and high ethical standards:

1. Solid academic foundation and the ability to lead in their field of expertise.
2. A comprehensive understanding of diverse academic fields, transcending specific specializations.
3. Proficiency in designing research strategies rooted in multidisciplinary and multilevel interdisciplinary approaches.
4. Creativity and execution skills to bridge basic research with industrial innovation.
5. Leadership and organizational capabilities to effectively guide diverse teams towards shared goals.
6. Proficiency in managing and implementing R&D strategies.
7. Effective dissemination of ideas to engage and impact the global community.

In this program, the primary assessment criterion focuses on students' capacity to identify and address societal or industrial challenges through a holistic, multidisciplinary approach. Success is measured by their ability to drive breakthroughs and foster industrial innovation across various fields without being confined to specific specializations.

II. Course Registration Guidelines

II-1. Registering for the Courses and Earning Credits

Students enrolled in the Leading Program Courses are required to register for subjects outlined by both the curriculum of the affiliated graduate school department and the curriculum of the SiMS Degree Program. Additionally, they must successfully earn the credits stipulated by each respective curriculum to fulfill the requirements for graduation.

II-2. Curriculum of the SiMS Degree Program

The curriculum of the SiMS Degree Program is detailed in Appendix 2.

II-3. Course Registration Reminders

Course applications are primarily determined by the graduate schools of Osaka Metropolitan University, with exceptions noted in II-4(3) and the syllabus.

Grades and credits are governed by the policies outlined in I-4 and II-4(3).

The academic calendar is set by the graduate schools of Osaka Metropolitan University.

II-4. Course Application Reminders

(1) If a student enrolled in the Leading Program Course in the second year of the master's program has previously completed a subject identical to a SiMS subject and earned credits for it, they are automatically considered to have fulfilled the requirements of the SiMS subject and earned credits accordingly. As a result, the details of the SiMS subject, including title, credits, and other pertinent information, will be reflected in the student's attendance book and transcript from the second year onwards. However, these credits will still count towards the completion requirements of the department's field.

(2) Credits earned through the completion of the Technology-based Entrepreneurship Course, as one of the literacy courses, will contribute towards meeting the completion requirements of the affiliated graduate school department.

(3) When applying for SiMS subjects, students must utilize the online registration system in a manner similar to ordinary subjects. However, exceptions apply to the Special Seminar for Scenario Task-Oriented Planning, Global Leadership Workshop, and TEC1-4. For further details, please contact the SiMS office.

II-5. Assessment of Progress

Progress in the SiMS Degree Program is assessed according to the following table:

| Assessment method | Assessment schedule | Qualifications for Examination and Defense |
|-----------------------------|---|--|
| SiMS Qualifying Examination | At the end of the third academic year(L3) | Detailed information will be provided separately. |
| SiMS Defense | At the end of the fifth year(L5) | Students expected to meet the doctoral program requirements of the affiliated graduate school department and earn 16 or more credits, including 12 credits for compulsory subjects as shown in the Appendix, are eligible for defense. |

- SiMS Defense may be conducted ahead of schedule for those who have met the qualifications for the examination mentioned in the table above.
- Detailed information regarding the date, method, and other relevant details of the SiMS Qualifying Examination will be provided in advance.

II-6. Requirements for advancement

Students must fulfill the following requirements to advance to the fourth year (L4, D2) of the SiMS Program:

- (1) Successfully complete the master's program and be enrolled in the doctoral program.
- (2) Pass the SiMS Qualifying Examination (SiMS QE), as mentioned in section 5.

*Details regarding the assessment, method, and other pertinent information of the SiMS Qualifying Examination (SiMS QE) will be provided separately.

II-7. Requirements for completion of the SiMS Degree Program

Students must meet the following requirements to be certified as having completed the SiMS Program:

- (1) Fulfill the requirements of the doctoral program of the affiliated graduate school department.
- (2) Successfully pass the SiMS Defense review as mentioned in section 5.

II-8. Additional Remark on the Diploma on the Completion of the SiMS Degree Program

Upon completion of the SiMS Degree Program, students will receive a diploma from the affiliated graduate school department, which will include an additional remark acknowledging the completion of the System-inspired Leaders for Multidisciplinary Science (SiMS) Degree Program. Furthermore, the transcript issued upon program completion will explicitly indicate the fulfillment of the Leading Program requirements of the affiliated graduate school department.

II-9. Loss of Qualification for Enrollment

Students who are deemed disqualified from continuing their studies in the SiMS Degree Program following a review of their academic performance and attitude will lose their enrollment qualification for the program. However, this does not preclude them from continuing their enrollment in the affiliated graduate school department and proceeding to write a thesis within the department.

III. Student Support

III-1. Education and Research Expenses

Expenses related to participation in academic meetings and overseas training required during the SiMS Degree Program will be covered within the budgetary constraints. Application procedures for reimbursement will be communicated as necessary..

III-2. Individual Mentoring by Persons with Experience as Corporate Executives

Upon enrollment in the SiMS Degree Program, each student will be assigned a mentor. These mentors will provide comprehensive support to students regarding various aspects of the program, including course selection, independent research planning, laboratory rotations, study abroad opportunities, and any other relevant matters.

III-3. Corporate Internship and Career Path Support

The Center for Advanced Education of Entrepreneurship and Innovation, known for its track record of producing doctoral researchers for industry, offers assistance in selecting internship hosts and designing career paths for students.

IV. Other

IV-1. Purchase of Personal Accident Insurance for Students Pursuing Education and Research and other insurance

Students enrolled in the SiMS Degree Program are required to obtain Personal Accident Insurance for Students Pursuing Education and Research (Gakkensai) and liability insurance incidental to Gakkensai, or provide proof of insurance equivalent to these for the duration of their enrollment.

IV-2. SiMS Office, Center for advanced education of entrepreneurship and innovation

The SiMS Office oversees administrative tasks related to the SiMS Degree Program. The office will disseminate information regarding registration, student support, and other necessary matters through email, phone, bulletin boards, or alternative communication channels. For inquiries, please contact the following:

Room 312, 3rd floor of A6 Building
Nakamozu Campus, Osaka Metropolitan University
TEL: +81-72-254-7852 FAX: +81-72-254-8293
E-mail: gr-idec-sims@omu.ac.jp
URL: <https://www.omu.ac.jp/las/sims/>

IV-3. Contact Information

For inquiries about conferences and questions regarding the Leading Degree Program, please contact either the Education Affairs Division located in the A3 Building or the SiMS Office as indicated above. They will provide assistance and address any queries you may have.

Rubric Sheet for Defense [Interview]

Examination ID

| Evaluation point | Rubric Evaluation | | | | | |
|--|--|---|---|--|--|---|
| | 0-point | 1-point | 2-points | 3-points | 4-points | 5-points |
| ② Ability to overview the research from the system idea | Not aware regarding the ability to overview the research from the system idea | Aware regarding the ability to overview the research from the system idea but don't prepare for it. | Aware to overview the research from system idea and already gained certain knowledge about this point | Try to apply the ability to overview the research from the system idea in practice or practical place | Try to apply the ability to overview the research from the system idea in practice and understand it very well | Have the ability to apply this idea in many situations/scenes |
| ③ Ability to design the research strategy for multilevel, interdisciplinary research | Not aware of the point to design the research strategy for multilevel, interdisciplinary research | Aware to design the research strategy for multilevel, interdisciplinary research but don't prepare for it | Aware to design the research strategy for multilevel, interdisciplinary research and already gained certain knowledge | Try to apply the ability to design the research strategy for multilevel, interdisciplinary research in practice or practical place | Try to apply the ability to design the research strategy for multilevel, interdisciplinary research in practice and understand it very well | Have the ability to apply this idea in many situations/scenes |
| ④ Ability to connect basic research with industrial innovations | Not aware to connect basic research with industrial innovations | Aware to connect basic research with industrial innovations but don't prepare for it | Aware to connect basic research with industrial innovations and already gained certain knowledge about this point | Try to apply the ability to connect basic research with industrial innovations in practice or practical place | Try to apply the ability to connect basic research with industrial innovations in practice and understand it very well | Have the ability to apply this idea in many situations/scenes |
| ⑤ Management skills to connect basic research with industrial innovations | Not aware of the management capabilities to connect basic research with industrial innovations | Aware of the management capabilities to connect basic research with industrial innovations but don't prepare for it | Consider the point of management skills to connect basic research with industrial innovations and already gained certain knowledge about this point | Try to apply the management skills/ability to connect basic research with industrial innovations in practice or practical place | Try to apply the management skills/ability to connect basic research with industrial innovations in practice and understand it very well | Have the management skills/ability to apply this idea in many situations/scenes |
| ⑥ Leadership capabilities to spread one's own idea to the world | Not aware of the leadership capabilities to spread one's own idea to the world | Aware of the leadership capabilities to spread one's own idea to the world but don't prepare for it | Aware of leadership capabilities to spread one's own idea to the world and already gained certain knowledge about this point | Try to apply the leadership capabilities to spread one's own idea to the world in practice or practical place | Try to apply the leadership capabilities to spread one's own idea to the world and start to get the ability to spread the idea to the world | Have the leadership capabilities to apply this idea in many situations/scenes |
| ⑦ Ability to spread one's own idea to the world | Not aware of the wide range of activities in which they go across their speciality with global perspective | Consider the wide range of activities in which they go across their speciality or activity with global perspective but don't prepare for it | Consider the wide activity in which they go across their speciality with global perspective and already gained certain knowledge about this point | Try to apply the wide activity in which they go across their speciality with global perspective in practice or practical place | Consider the wide activity in which they go across their speciality with global perspective and they have experience in practice or practice place | Consider the wide activity in which they go across their speciality with global perspective and have many experience in practice or practice place and have ability to spread one's own idea to the world |

Appendix 2

Curriculum and Accreditation of the SiMS Program

*Compulsory

| Courses | Subject title | Credits | Academic year | The number of credits for designated subjects |
|---|--|---------|---------------|--|
| Literacy | Scientific Literacy* | ② | 1-2 | 4 credits or more |
| | Studies on International Environmental Issues | 2 | 1-2 | |
| | Special Seminar for Scenario Task Oriented Planning | 2 | 1-2 | |
| | Technology Based Entrepreneurship Course* | ② | 1-2 | |
| Interdisciplinary | Special communication seminar based on multidisciplinary sciences | 2 | 1-2 | 2 credits or more |
| | SiMS Special Research (Laboratory Rotation) * | ② | 3-5 | |
| Ideation | Special Seminar for Strategic Reasoning and Thinking1* | ② | 1-2 | 4 credits or more |
| | Special Seminar for Strategic Reasoning and Thinking2* | ② | 1-2 | |
| | The Ideation and Globalization Workshop | 2 | 3-5 | |
| Global | Special Seminar for Global Communication | 2 | 1-2 | 2 credits or more |
| | Global Leader Workshop* | ② | 3-5 | |
| Entrepreneurship | Technology-based-Entrepreneurship Course 1. (TEC-1 Business Planning) | 2 | 3-5 | 4credits or more including 2 subjects (2 credits) from 8 subjects marked with (*). |
| | Technology-based-Entrepreneurship Course 2 A (*) (TEC-2A Management of Technology) | 1 | 3-5 | |
| | Technology-based-Entrepreneurship Course 2 B (*) (TEC-2B Management of Technology Exercises) | 1 | 3-5 | |
| | Technology-based-Entrepreneurship Course 2 C (*) (TEC-2C Intellectual Property Plan) | 1 | 3-5 | |
| | Technology-based-Entrepreneurship Course 2 D (*) (TEC-2D Idea Creation) | 1 | 3-5 | |
| | Technology-based-Entrepreneurship Course 2 E (*) (TEC-2E Management & Marketing) | 1 | 3-5 | |
| | Technology-based-Entrepreneurship Course 2 F (*) (TEC-2F Venture Business & Entrepreneurship Basics) | 1 | 3-5 | |
| | Technology-based-Entrepreneurship Course 2 G (*) (TEC-2G Venture Business) | 1 | 3-5 | |
| | Technology-based-Entrepreneurship Course 2 H (*) (TEC-2H Leadership) | 1 | 3-5 | |
| | Technology-based-Entrepreneurship Course 3 (TEC-3 Company Research Practical Seminar) | 2 | 3-5 | |
| | Technology-based-Entrepreneurship Course 4 (TEC-4 Training for Future R&D Leader Seminar) | 2 | 3-5 | |
| Number of credits required for completion | | | | 16 credits or more (including 12 required credits) |