Doctoral Program in Empowerment Informatics

Name of the degree to be conferred	Master of Engineering Doctor of Philosophy in Human Informatics
Educational purpose	To cultivate global leaders that can take initiatives and design systems to empower people in the international society of people with diversified cultural background.
Vision of human resources development	Human resources that have the following three practical abilities, including inter-disciplinary ability to consider issues from multifaceted perspectives, frontline ability to resolve real-world problems in industrial, governmental and academic spheres and presentation ability to communicate and appeal the essence of research achievements, in addition to basic research ability in the area of "Empowerment Informatics" as "Informatics that supplements and extends human functions and enables technology to work in harmony with people".

Diploma Policy

The degree of Doctor of Philosophy in Human Informatics is commenced to those who have fulfilled the requirements for the completion of the Doctoral programs, as set out in the Graduate School Regulation of the University of Tsukuba and related university regulations, and who are deemed to have the following competencies.

At the interim evaluation, the degree of Master of Engineering will is commenced to those who have fulfilled the requirements for the completion of the Master's programs, as set out in the Graduate School Regulation of the University of Tsukuba and related university regulations, and who have passed the Qualifying Examination.

Competencies	Evaluation perspectives
1. Knowledge creation competence: Ability to create new knowledge that can contribute to future society	① Are there any research findings that can be considered new knowledge? ② Can we expect you to create knowledge that will contribute to future society?
2. Management competence: Ability to plan and implement measures to identify and solve challenges from a higher perspective	① Can you make and implement long-term plans for critical challenges? ② Can you identify challenges, even in other areas of expertise, and solve them from a higher perspective?
3. Communication competence: Ability to express the true nature of academic findings positively and clearly	① Can you explain the true nature of research content and specialized knowledge clearly and logically to researchers from different areas and to people other than researchers? ② Do you proactively share your findings with researchers and experts from your field of expertise and accurately answer questions?
4. Leadership competence: Ability to have objectives get accomplished under your leadership	① Can you set attractive and compelling goals? ② Are you capable of building systems to realize goals and accomplish objectives as the leader?
5. Internationality competence: Possession of a high level of awareness and motivation to be internationally active and contribute to international society	① Do you have strong awareness and motivation to contribute to international society and international activities? ② Have you obtained adequate linguistic skills for international information collection and action?
6. Interdisciplinary ability: ability to utilize the knowledge the area of expertise in human informatics and the one other than in one's own area for various tasks.	① If there is basic specialized knowledge which covers the areas that constitute human informatics ② If there are discussion, research or practical business obtained based on the knowledge in the area other than one's own area of expertise.

7. Presentation ability: ability to set leading-edge research tasks in human informatics and to achieve internationally competent creative results.	① If there is creative research ability to contributes to development of human informatics and performance to be recognized as an expert ② If capable of making presentation of research outcomes in international conference and discuss about them.
8. Frontline ability: ability to plan and explain the methods to resolve real-world problems base on ethical view and ethical knowledge appropriate for researchers in the area of human informatics or highly specialized professionals.	① If capable of trying to solve actual problems and draft a new project. ② If capable of properly grasping/analyzing the obstacle upon solving actual problems and considering the measures to overcome them. ③ If capable of understanding and complying with the procedures required for researcher ethics, engineer ethics, ethics and research relating to the research tasks to people.

Dissertation evaluation criteria

【Master's program】
A thesis is accepted if all of the following evaluation items are proven to be met.
1. Based on understanding of preceding research in relevant area, if the significance and positioning of the said research in human informatics is described.
2. If original research findings in the areas of engineering are contained well enough to be presented in academia, etc.
3. If constant reliability is found in the research outcomes.
4. If research results are appropriately discussed and an adequate conclusion is drawn
5. If research backgrounds, purposes, methods, results, discussions, conclusions, etc. are organized in a format appropriate as a master's degree thesis
<Level standards required for the degree thesis, review board members, review method and review items, etc.>
A master's thesis review board shall consist of one chief examiner and two or more sub-chief examiners designated from teachers in charge of Degree Programs in Systems and Information Engineering.
However, where required, faculty members of other Degree Programs or other university graduate schools or laboratory researchers, etc. can serve as sub-reviewers.
The chief reviewer must be the research supervisory faculty member. As the sub-reviewers, two or more applicable faculty members of the Degree Programs in Systems and Information Engineering of the Graduate School must be included.
A master's thesis review board shall examine specific theme research in accordance with the standard relating to master's thesis review and conduct acceptance decision. The thesis approved to satisfy the standard as the one for a degree regarding the above-mentioned evaluation items 1. to 5. shall be accepted after finishing interview (oral) examination.
【Doctoral Program】
The thesis for a degree shall satisfy the following evaluation items and passing the final exam shall be the requirement for granting doctorate degree.
<Criteria for degree thesis review>
1. Based on understanding of international research tendency and preceding research in relevant area, if the significance and positioning of the said research in human informatics is clearly described.
2. If the appropriate amount of original research outcomes that contribute to development of human informatics for presenting as a thesis is included.
3. If Research results are sufficiently verified in reliability
4. If research results are adequately discussed and concluded based on objective evidence
5. If research backgrounds, purposes, methods, results, discussions, conclusions, etc. are organized in a format appropriate as a doctoral dissertation
<Criteria for final exam>
1. 【Interdisciplinary ability】If there is basic specialized knowledge which covers the areas that constitute human informatics
2. 【Interdisciplinary ability】If there are discussion, research or practical business obtained based on the knowledge in the area other than one's own area of expertise.
3. 【Presentation ability】If there is creative research ability to contributes to development of human informatics and performance to be recognized as an expert

4. 【Presentation ability】 If capable of making presentation of research outcomes in international conference and discuss about them.
5. 【Frontline ability】 If capable of properly grasping/analyzing the obstacle upon solving actual problems and considering or planning the measures to overcome them.
6. 【Frontline ability】 If capable of understanding and complying with the procedures required for researcher ethics, engineer ethics, ethics and research relating to the research tasks to people.

<Level standards required for the degree thesis, review board members, review method and review items, etc.>

A doctoral thesis review board shall be composed of one chief examiner and three or more sub-chief examiners.

Among these examiners, the chief examiner and two or more sub-chief examiners shall be designated from teachers in charge of Empowerment Informatics Program (thesis supervisors), two or more of whom shall be professors.

Besides, if necessary, one person designated by the chair of Assessment of Student Achievement Committee shall participate as an observer, who shall bear responsibility for confirming that the thesis examination is properly carried out.

A doctoral thesis review board shall examine thesis in accordance with the standard relating to thesis review and conduct acceptance decision. The dissertation passes if approved to be on a doctoral dissertation level in all of the above evaluation items 1 to 5 with the final (oral) exam included in the judgment.

Curriculum Policy

Based on the system of "Empowerment Informatics" as "Informatics that supplements and extends human functions and enables technology to work in harmony with people", the followings three areas that consider the exit points as career path:

・Supplementation・・・to supplement the reduced physical and sensory functions of disabled and senior people.
・Harmony・・・to harmonize so that engineering systems which people contact with in their daily lives can be integrated into them.
・Extensions・・・to externalize the latest creative functions that people potentially have.

Additionally, the curriculum shall be organized to cultivate the abilities required for advanced global leaders appropriate for a doctor through diversified programs. user-related elements (understanding of people), cross-disciplinary course work to acquire cross-disciplinary knowledge based on system-related elements (system engineering understanding), contents-related elements (packaging technology) practical research training to meet social needs etc.

The education/research supervision shall be provided to cultivate wide basic knowledge in Systems and Information Engineering, wide view to cover Science and Technology and generic competences to support the active role in social diversified settings, including research ability, specialized knowledge and ethical view.

Curriculum organization policy	The curriculum shall be organized by setting enhancement of research ability relating to Empowerment Informatics as a primary purpose and in order to contribute to cultivating basic knowledge and wide view, generic competences in relevant areas. As necessary, it is recommended to register the credits from Degree Programs' Common Courses, Inter-disciplinary Foundation Courses and Graduate General Education Courses. In research supervision, in order to foster the research ability with multifaceted perspectives, multidisciplinary research advisory system shall be adopted (the faculty members in other doctoral programs shall participate in the courses as necessary). Detailed courses to be taken and deployment of multiple supervisors shall be decided with consideration to the research plans of individual students and their career plans etc.
	【Generic competences】
	・To acquire Competence of knowledge creation mainly through Advanced Research (Seminar in Empowerment Informatics I, II, III, IV, V), Practicum and Practical Classes(Oral Presentation Workshop in Empowerment, Research Paper Writing Workshop in Empowerment Informatics, Conference Paper and Journal Paper Writing Exercise in Empowerment Informatics).
	・To acquire Management competence mainly through Advanced Research and Empowerment Informatics Project-based Research.
	・To acquire communication skills mainly through Advanced Research, Introduction to Empowerment Informatics, Practical Training in Engineering Residence.

·To acquire Leadership competence mainly through Advanced Research.
·To acquire Competence in Internationality through Advanced Practical Training and Advanced Research.

【Specialized knowledge/ability】
·To acquire interdisciplinary ability mainly through Introduction to Empowerment Informatics, Advanced Practical Training, Advanced Research, Degree Programs' Common Courses (mainly in the area of Empowerment Informatics).
·To acquire presentation ability mainly through Advanced Research, Advanced Practical Training, Empowerment Informatics Project-based Research, Conference Paper and Journal Paper Writing Exercise in Empowerment Informatics, Conference Paper and Journal Paper Writing Exercise in Empowerment Informatics, Research Paper Writing Workshop in Empowerment Informatics.
·To acquire frontline ability mainly through Introduction to Empowerment Informatics, Advanced Research and Practical Training in Engineering Residence.
·For the students with diversified academic backgrounds, the courses to acquire basic knowledge and skills necessary to commence research immediately after enrollment. Concurrently, students are supervised to identify socially and academically significant research tasks in their own right.
· Each student learns under their initiative for more specialized knowledge and skills through classes, etc. while working on their research tasks.
Additionally, by taking advantage of multidisciplinary research advisory system, to cultivate ability to see from a higher perspective and interdisciplinary ability to grasp issues from diversified perspectives by participating seminars of sub supervisors with different specialty.
·To provide instruction in order that research outcomes obtained are finally presented in academic research paper and receive evaluations from a large number of researchers.
Through this, to enhance Competence of knowledge creation, promote further research and empower people to acquire higher specialized knowledge/skills.
· Concurrently, each student does an achievement self-check wherever necessary to be encouraged to gain the knowledge or skills to made up for the lack to complete the Program.

Learning methods · Processes	·For the students with diversified academic backgrounds, the courses to acquire basic knowledge and skills relating to the elements, including understanding the characteristics of people (user-related elements), understanding system engineering (system-related elements) and understanding system structure and interaction design (contents-related elements) necessary to commence research immediately after enrollment, shall be focused on. Concurrently with the above-mentioned, such courses shall be implemented in order that students themselves can find research tasks having social impacts by satisfying interdisciplinarity, novelty and utility. · Each student learns under their initiative for more specialized knowledge and skills through classes, etc. while working on their research tasks. Additionally, by taking advantage of multidisciplinary research advisory system, to cultivate ability to see from a higher perspective to grasp issues from diversified perspectives by participating seminars of sub supervisors with different specialty. ·To provide instruction in order that research outcomes obtained are finally presented as peer-reviewed academic research paper and receive evaluations of high level. Through this, to enhance Competence of knowledge creation, promote further research and empower people to acquire higher specialized knowledge/skills. · Concurrently, each student does an achievement self-check wherever necessary to be encouraged to gain the knowledge or skills to made up for the lack to complete the Program.

Evaluation of learning outcomes	・Learning outcomes shall be evaluated in accordance with "Tabled of Methods for Grading Achievement of Objectives Relating to Learning and Education". ・In "EMP seminar" of the first year and the second year, the research progress of the students shall be promptly reported and receive evaluation and feedback. ・At the end of each year of the first to fourth year, the students shall submit their achievement self-check sheets to supervisor, receive evaluation by supervisor for achievement and confirmation of their research progress. Based on these, registration plan and research plan shall be reviewed. ・By Qualifying Examination (comprehensive examination of basic abilities) of the second year, the possibility of undertaking intensive work on Ph.D. thesis shall be examined. ・In Final Assessment of Student Achievement, students' achievement and if their submission of Ph.D. thesis is approved or not shall be examined. ・In Final Assessment of Student Achievement, students' achievement shall be confirmed.

Admission Policy

Desired students	The desired students shall have sufficient research ability such as adaptability in the area of expertise to explore the essence and resolve real problems, multilateral and multifaceted ability to see from a higher perspective and creativity etc. to develop a new horizon for the most advanced and latest discipline, the capacity as a leader to tackle various global issues that spread in real society and strong enthusiasm and career aspiration to aim at becoming global leaders in industries.
Selection policy	The basic policy is to select the human resources appropriate for coexistence of academic character and practical skills. We shall correspond to diversified applicants through recommendation entrance examination and general entrance examination by dividing the number of expected applicants and implementing multiple entrance examinations in the same fiscal year. Regardless of examination categories, foreign language (submission of TOEIC official score certificate, examinee score report of TOEFL etc., upon application) and oral examination are compulsory. In oral examination, the interview relating research plan and career plan shall be performed. ・In recommendation entrance examination (July), the ideal candidates shall be the ones who make our degree program their number one choice, get good grades and excellent ability necessary for research in Empowerment Informatics. ・In the 1st General Examination (August), the applicants who have high basic academic skills in mathematics/English etc., have clear statement of purpose for applying our degree program and excellent ability in concreteness and conception for career plan. Furthermore, in the 2nd General Examination (February), the applicants shall be selected through evaluation of their graduate study (or the alternatives) in addition to the above-mentioned.