Supplementary Handbook about Credit System for Doctoral Students

of International Program in Science and Engineering
Waseda University

2017 Spring

I. Objective of the doctoral program credit system

Doctoral students strive to set clear goals for their studies, conduct research, and collect results, thereby conducting research activities that enhance the future of humanity. Such work often requires deep reflection on the state of humanity. The purpose of introducing the credit system in the doctoral program is to encourage researchers to engage in deeper reflection and to enable them to have greater expressive power.

II. Guidelines on Program Completion

1. The instructor in charge of research guidance at the time of admission will become the student's supervisor.
2. To receive a doctorate degree, the student must be enrolled in the doctoral program for five years or longer (including time spent in a master's program), earn the required credits prescribed for each department, receive the required research guidance, and pass a doctoral thesis defense. For students who are recognized by the Graduate School Steering Committee as having made outstanding achievements, three years or more (including time spent in a master's program) will be considered sufficient time to fulfill the attendance period.
3. Students of the doctoral program may not attend the program for a period exceeding six years.
4. Students must register (apply for and confirm their registration for) courses to take for the year of their specified course registration period. When selecting courses, read this handbook, web syllabus, etc., thoroughly and set personalized learning goals. Make sure not to register for courses incorrectly or fail to register for planned courses.
   Web syllabus: https://www.wsl.waseda.jp/syllabus/JAA101.php?pLng=en
   Students may not attend courses for which they are not registered. Students cannot earn credits for attending courses that have not been registered for, even if they attend the course classes or take the examinations. Students may not change or cancel registered courses outside of the designated period. Course registration should be done carefully and in person. Be sure to confirm the results of your registration. When registering for courses, students should be sure to confirm their selections with their supervisors in advance, and that they only register for approved courses. For actual application procedures, check the instructions on the Faculty of Science and Engineering website.
5. Writing of the doctoral dissertation and research work in general should be performed in accordance with the supervisor's instructions.
6. Receiving research ethics education designated by each department is considered a prerequisite for accepting doctoral dissertations.
7. For students choosing to leave the program without submitting a doctoral dissertation, if the student has attended the doctoral program for three years or more and received all required

research guidance, the dissertation may be submitted and the qualifying examination taken within a three-year period beginning on the day of withdrawal.

III. Course list of common courses

Common courses for the three graduate schools within the Faculty of Science and Engineering (the Graduate School of Fundamental Science and Engineering, the Graduate School of Creative Science and Engineering, and the Graduate School of Advanced Science and Engineering) are shown below.

[Doctoral Course]

Research Ethics Courses

Course Name	Credits	Class hours per week		Provided by
		Spring	Fall	
研究倫理概論A	1	2(first-half)	0	社会文化領域
研究倫理概論B	1	0	2(first-half)	
Ethics and Research	1	2(first-half)	0	International Center for Science and Engineering

English Courses

Course Name	Credits	Class hours per week		Provided by
		Spring	Fall	
Doctoral Student Technical Writing	1	Intensive	0	Center for English Language Education in Science and Engineering
		2	0	
		0	2	
Doctoral Student Presentation Skills	1	0	Intensive	

Industrial Society/ Liberal Arts Courses

Course Name	Credits	Class hours per week		Provided by
		Spring	Fall	
国際知財政策概論	1	2(second-half)	0	社会文化領域
近代思想と現代1	1	0	2(first-half)	
近代思想と現代2	1	0	2(second-half)	
社会学的思考と方法	1	2	0	
社会学的研究と方法	1	2	0	
経済学概論A	1	2	0	
経済学概論B	1	2	0	
異文化理解の心理学	1	0	2(second-half)	
組織と集団の心理学	1	0	2(first-half)	

現代日本の貧困問題	1	2(second-half)	0	社会文化領域
現代世界の貧困問題	1	2(first-half)	0	
原典講読	1	2(second-half)	0	
地域社会論	1	2(first-half)	0	
Japanese Thought and Culture	1	2(second-half)	0	International Center for Science and Engineering
Science and Education	1	0	2(second-half)	
Advanced Topics in Philosophy of Science	1	2(first-half)	0	
Advanced Topics in History of Science	1	2(first-half)	0	
Advanced Topics in Social and Political Theory	1	0	2(first-half)	
Philosophy of Education	1	0	2(first-half)	
Science and Rhetoric	1	2(second-half)	0	

Innovator/Entrepreneur Training Courses

These courses listed below are provided by Global Education Center as Group of innovator / entrepreneur training courses. Please be aware of that when you register courses.

Course Name	Credits	Class hours per week	
		Spring	Fall
ビジネスモデル仮説検証法演習	1	Intensive	
起業特論A:トップリーダーマネジメント	1	Intensive	0
起業特論B:スタートアップエッセンシャル	1	Intensive	0
		0	Intensive
起業特論C:トップリーダーマネジメント	1	0	Intensive
Advanced Course on Entrepreneurship D	1	Intensive	0
イノベーション概論：理工系次世代イノベーターのためのエッセンシャルズ	2	0	Intensive
博士実践特論A:イノベーションリーダーシップ	2	Intensive	0
		0	Intensive
博士実践特論B:産業イノベーションとキャリアデザイン	1	2(second-half)	0
博士実践特論S:ロジカル コミュニケーション	2	Intensive	0
CSR マネジメント実践	2	Intensive	0
		0	Intensive
グローバルビジネスコミュニケーション基礎	1	0	2(first-half)
グローバルビジネスコミュニケーション上級	2	0	Intensive
イノベーション概論 α :次世代イノベーターのためのエッセンシャルズ(大学院生)	1	0	Intensive
イノベーション概論 β :次世代イノベーターのためのエッセンシャルズ(大学院生)	1	0	Intensive

イノベーションとテクノロジー基礎α：人工知能・先端ロボットテクノロジーの基礎とスタートアップを学ぶ	1	Intensive	0
イノベーションとテクノロジー基礎β：人工知能・先端ロボットテクノロジーの基礎とスタートアップを学ぶ	1	Intensive	0
イノベーションとテクノロジー実践α：人工知能・先端ロボットテクノロジー実践	1	0	Intensive
イノベーションとテクノロジー実践β：人工知能・先端ロボットテクノロジー実践	1	0	Intensive
ビジネスアイデアデザイン（大学院生）	1	4	0
イノベーション創出思考法 1（大学院生）	1	Intensive	0
イノベーション創出思考法 2（大学院生）	1	0	Intensive
イノベーション・プラクティス（大学院生）	1	2(second-half)	0

Non-degree Courses

Course Name	Credits	Class hours per week		Provided by	
		Spring	Fall	Graduate School	Department
Advanced Study of Nonlinear Mechanics	4			Fundamental	Pure and Applied Math
Special Lecture on Mathematical Fluid Mechanics	4	Intensive			
Foundation of Mathematical Analysis 1	2	2	0		
Foundation of Mathematical Analysis 2	2	0	2		
Foundations of Geometry 1	2	2	0		
Computer Assisted Proof of Nonlinear Equations	2	2	0		
幾何学の基礎数学2	2	2	0		
Fluid Mechanics of Computing	2	Intensive	0	Creative	Modern Mechanical Engineering
Advanced Topics in Applied Mechanics of Fluid-Structure Interactions	2	0	2		
場の古典論の数学的基礎	2	0	2	Advanced	Pure and Applied Physics
Physics of Non-Equilibrium Systems A	2	2	0		
Physics of Non-Equilibrium Systems B	2	0	2		
Advanced Theoretical Quantum Physics B	2	2	0		
量子物理学特別講義	4	Intensive			
量子力学の数学的基礎	2	2	0		
Advanced Theoretical Quantum Physics A	2	2	0		
Professional Communication 1	1	2	0	Center for English Language Education	
Professional Communication 2	1	0	2		
Workplace English 1	1	2	0		
Workplace English 2	1	0	2		

IV. Instruction of required courses by each department

Graduate School of Fundamental Science and Engineering

Department of Pure and Applied Mathematics

1. Five credits must be earned from the list of prescribed group courses.
2. One credit must be earned from the research ethics courses.
3. One credit must be earned from the English course “Doctoral Student Technical Writing”.
4. Three credits must be earned from the English courses (excluding the course named in 3. above), industrial society/liberal arts courses, innovator /entrepreneur training courses, or courses offered by the department.

（Courses offered by the department above）

Course Name	Credits	Class hours per week	
		Spring	Fall
Advanced Study of Nonlinear Mechanics	4	Intensive	
Special Lecture on Mathematical Fluid Mechanics	4	Intensive	
Foundation of Mathematical Analysis 1	2	2	0
Foundation of Mathematical Analysis 2	2	0	2
Foundations of Geometry 1	2	2	0
Computer Assisted Proof of Nonlinear Equations	2	2	0
幾何学の基礎数学2	2	2	0

Department of Applied Mechanics

1. Five credits must be earned from the list of prescribed group courses.
2. One credit must be earned from the research ethics courses.
3. Four credits must be earned from the English courses, industrial society/liberal arts courses, innovator /entrepreneur training courses, or courses offered by the department.

（Courses offered by the department above）

Course Name	Credits	Class hours per week	
		Spring	Fall
Seminar on Applied Mechanics A	1	◎	0
Seminar on Applied Mechanics B	1	0	◎

Department of Electronic and Physical Systems

1. Five credits must be earned from the list of prescribed group courses.
2. One credit must be earned from the research ethics courses.
3. One credit must be earned from the English course “Doctoral Student Technical Writing”.
4. Three credits must be earned from the English courses, industrial society/liberal arts courses, innovator /entrepreneur training courses, or courses offered by the department.
5. For requirement 4. above, up to two credits from Master’s courses offered by the department registered during doctoral program may be counted towards doctoral credits.

Department of Computer Science and Communications Engineering

1. Five credits must be earned from the list of prescribed group courses.
2. One credit must be earned from the research ethics courses.
3. Four credits must be earned from the English courses, industrial society/liberal arts courses, innovator /entrepreneur training courses, or courses offered by the department.
4. For requirement 3. above, up to two credits from Master’s courses offered by the department registered during doctoral program may be counted towards doctoral credits.

（Courses offered by the department above）

Course Name	Credits	Class hours per week	
		Spring	Fall
Special Seminar A in Computer Science and Communications Engineering	1	◎	0
Special Seminar B in Computer Science and Communications Engineering	1	0	◎

Department of Intermedia Studies

1. Five credits must be earned from the list of prescribed group courses.
2. One credit must be earned from the research ethics courses.
3. Four credits must be earned from the English courses, industrial society/liberal arts courses, innovator /entrepreneur training courses, or courses offered by the department.
4. Students of other departments are not allowed to take Seminar on Intermedia studies A/B.

（Courses offered by the department above）

Course Name	Credits	Class hours per week	
		Spring	Fall
Seminar on Intermedia studies A	2	◎	0
Seminar on Intermedia studies B	2	0	◎

Graduate School of Creative Science and Engineering

Department of Architecture

1. Five credits must be earned from the list of prescribed group courses.
2. One credit must be earned from the research ethics courses.
3. Four credits must be earned from the English courses, industrial society/liberal arts courses, innovator /entrepreneur training courses, or courses offered by the department.
4. In requirement 3. above, up to two credits from Master's courses offered by the department registered during doctoral program may be counted towards doctoral credits.
5. For research ethics courses, approved courses from programs outside the department can be taken for credit if the courses in question are condsidered appropriate for the department.

（Courses offered by the department above）

Course Name	Credits	Class hours per week	
		Spring	Fall
Architectural special exercise for doctor degree A	1	◎	0
Architectural special exercise for doctor degree B	1	0	◎

Department of Modern Mechanical Engineering

1. Five credits must be earned from the list of prescribed group courses.
2. One credit must be earned from the research ethics courses.
3. Four credits must be earned from the English courses, industrial society/liberal arts courses, innovator /entrepreneur training courses, or Master's and undergraduate courses. However, courses taken for credit during or before the master's program cannot be registered.

Department of Industrial and Management Systems Engineering

1. Five credits must be earned from the list of prescribed group courses.
2. One credit must be earned from the research ethics courses.

3. Four credits must be earned from the English courses, industrial society/liberal arts courses, innovator /entrepreneur training courses, or courses offered by the department.

（Courses offered by the department above）

Course Name 名	Credits	Class hours per week	
		Spring	Fall
グローバル経営システム工学	1	◎	◎

Department of Business Design and Management

1. Five credits must be earned from the list of prescribed group courses.
2. One credit must be earned from the research ethics courses.
3. One credit must be earned from the English course “Doctoral Student Technical Writing”.
4. Three credits must be earned from the English courses (excluding the course named in 3. above), industrial society/liberal arts courses, innovator /entrepreneur training courses, or courses offered by the department.
5. For joint courses with the master’s program, credits earned during the master’s program cannot be registered.

（Courses offered by the department above）

Course Name	Credits	Class hours per week	
		Spring	Fall
技術系経営幹部講話	1	前半 2	0
経営課題対応事例研究	1	0	前半 2
経営工学の歴史と体系	1	0	前半 2

Department of Civil and Environmental Engineering

1. Five credits must be earned from the list of prescribed group courses.
2. One credit must be earned from the research ethics courses.
3. Four credits must be earned from the English courses, industrial society/liberal arts courses, innovator /entrepreneur training courses, or courses offered by the department.

（Courses offered by the department above）

Course Name	Credits	Class hours per week	
		Spring	Fall
Exercise A of civil & environmental engineering	2	◎	0
Exercise B of civil & environmental engineering	2	0	◎

Department of Earth Sciences, Resources, and Environmental Engineering

1. Five credits must be earned from the list of prescribed group courses.
2. One credit must be earned from the research ethics courses.
3. Four credits must be earned from the English courses, industrial society/liberal arts courses, innovator /entrepreneur training courses, or courses offered by the department.
4. For requirement 3. above, up to two credits from Master's courses offered by the department registered during doctoral program may be counted towards doctoral credits.

（Courses offered by the department above）

Course Name	Credits	Class hours per week	
		Spring	Fall
Special seminar on Mineral Resources	2	◎	◎
Special seminar on Petrology	2	◎	◎
Special seminar on Geology	2	◎	◎
Special seminar on Geoexploration Engineering	2	◎	◎
Special seminar on Development and Environmental Engineering	2	◎	◎
Special seminar on Resources Recycling Engineering	2	◎	◎
Special seminar on Materials Processing	2	◎	◎
Special seminar on Environmental Protection	2	◎	◎

Graduate School of Advanced Science and Engineering

Department of Pure and Applied Physics

1. Five credits must be earned from the list of prescribed group courses.
2. One credit must be earned from the research ethics courses.
3. Four credits must be earned from the English courses, industrial society/liberal arts courses, innovator /entrepreneur training courses, or courses offered by the department.

（Courses offered by the department above）

Course Name	Credits	Class hours per week	
		Spring	Fall
Study Abroad in Physics and Applied Physics A	1	◎	◎
Study Abroad in Physics and Applied Physics B	1	◎	◎
Study Abroad in Physics and Applied Physics C	1	◎	◎
Study Abroad in Physics and Applied Physics D	1	◎	◎

Department of Chemistry and Biochemistry

1. Five credits must be earned from the list of prescribed group courses.
2. One credit must be earned from the research ethics courses.
3. One credit must be earned from the English course “Doctoral Student Technical Writing”.
4. Three credits must be earned from the English courses (excluding the course named in 3. above), industrial society/liberal arts courses, innovator / entrepreneur training courses, or courses offered by the department.

（Courses offered by the department above）

Course Name	Credits	Class hours per week	
		Spring	Fall
Special Seminar on Chemistry and Biochemistry A	1	1	0
Special Seminar on Chemistry and Biochemistry B	1	0	1
Special Seminar Abroad on Chemistry and Biochemistry	1	◎	◎

Department of Applied Chemistry

1. Five credits must be earned from the list of prescribed group courses.
2. One credit must be earned from the research ethics courses.
3. One credit must be earned from the English course “Doctoral Student Technical Writing”.
4. Three credits must be earned from the English courses (excluding the course named in 3. above), industrial society/liberal arts courses, innovator /entrepreneur training courses, or courses offered by the department.

（Courses offered by the department above）

Course Name	Credits	Class hours per week	
		Spring	Fall
Practical Chemical Wisdom: Seminar A	1	◎	◎
Practical Chemical Wisdom: Seminar B	1	◎	◎

Department of Life Science and Medical Bioscience

1. Five credits must be earned from the list of prescribed group courses.
2. Either a course from the research ethics courses (for one credit) or “サイエンスコミュニケーションと研究倫理” (for two credits) must be taken. If credits for “サイエンスコミュニケーションと研究倫理” were earned during the master’s program, no further credits in research ethics will be required.
3. One credit must be earned from the English course “Doctoral Student Technical Writing”.

4. Combined with the credits earned in 2. above and 3. above, a total of five credits must be earned from the English courses (excluding the course named in 3. above), industrial society/liberal arts courses, innovator /entrepreneur training courses, or courses offered by the department. If "サイエンスコミュニケーションと研究倫理" was taken during the master's program, those credits can be counted toward this total.
5. For requirement 4. above, up to two credits from Master's courses offered by the department registered during the doctoral program may be counted towards doctoral credits.
6. For requirement 4. above, credits from other universities or organizations may be transferred.

Course Name	Credits	Class hours per week	
		Spring	Fall
Practical Training for Career Building	1	◎	◎

Department of Electrical Engineering and Bioscience

1. Five credits must be earned from the list of prescribed group courses.
2. One credit must be earned from the research ethics courses.
3. One credit must be earned from the English course "Doctoral Student Technical Writing". (Note: students who attended universities in English-speaking countries should take alternate courses.)
4. Three credits must be earned from the English courses (excluding the course named in 3. above), industrial society/liberal arts courses, innovator /entrepreneur training courses, or courses offered by the department.

Department of Integrative Bioscience and Biomedical Engineering

1. Five credits must be earned from the list of prescribed group courses.
2. One credit must be earned from the research ethics courses.
3. One credit must be earned from the English course "Doctoral Student Technical Writing".
4. Three credits must be earned from the English courses (excluding the course named in 3. above), industrial society/liberal arts courses, innovator /entrepreneur training courses, or courses offered by the department.
5. For requirement 4. above, up to two credits from Master's courses offered by the department registered during the doctoral program may be counted towards doctoral credits.

Department of Nanoscience and Nanoengineering

1. Five credits must be earned from the list of prescribed group courses.
2. One credit must be earned from the research ethics courses.
3. One credit must be earned from the English course “Doctoral Student Technical Writing”.
4. Three credits must be earned from the English courses (excluding the course named in 3. above), industrial society/liberal arts courses, innovator /entrepreneur training courses, or courses offered by the department.
5. For requirement 4. above, up to two credits for Master’s courses offered by the department registered during the doctoral program may be counted towards doctoral credits.

Cooperative Major in Nuclear Energy

The above department does not adopt the doctoral program credit system – please see the Guidelines on Program Completion and the Cooperative Major’s respective pages of the main handbook.