

**Program Requirements**  
International Master's/Doctoral Programs  
Graduate School of Engineering

履修の手引き

工学府

グローバルコース  
修士課程 / 博士後期課程

October 2022

# Program Requirements

## International Master's Programs Graduate School of Engineering

A student shall be required to:

- be enrolled in the program for at least two years;
- acquire at least 30 credits from “Required Specialized Courses”<sup>\*1</sup> and “Cross-disciplinary Courses”<sup>\*\*2</sup> by meeting the specific requirements listed below;
- undertake guided research; and
- pass the thesis examination.

Programs	Requirements
Materials	1. Four or more credits from “Advanced Subjects” are to be included in the total credits.
Applied Chemistry	2. Two or more credits from “Advanced Specialized Subjects” are to be included in the total credits.
Chemical Engineering	3. Four or more credits from “Professional Skill Development” are to be included in the total credits.  *Note: For the Applied Chemistry program, four or more credits from “Exercises in Reference Search”, “Communication Training in Applied Chemistry (1)”, or “Student Seminar in Applied Chemistry (1)” are also required to make up a part of the total credits.
Mechanical Engineering	1. Ten or more credits for “Advanced Subjects” and “Advanced Specialized Subjects” from at least 5 areas among 6 areas are to be included in the total credits. At least 1 subject from each of the 5 areas must be chosen.  2. Six or more credits from “Professional Skill Development” are to be included in the total credits.  ※Besides the subjects of International Master's Programs in Mechanical Engineering, the student may take the subjects in the Mechanical Engineering Course shown in the Registration Information textbook in the consultation with the student's supervisor, and which are taught in Japanese as the main language. The student can not take subjects with the same number (such as ENG-MCE1111J and ENG-MCE1111E) as these subjects are treated as one.
Hydrogen Energy Systems	1. Ten or more credits from “Advanced Subjects” are to be included in the total credits.  2. Two or more credits from “Advanced Specialized Subjects” are to be included in the total credits.

	<ol style="list-style-type: none"> <li>3. Two or more credits from “Professional Skill Development” are to be included in the total credits.</li> <li>4. Two or more credits from “Advanced Japanese Industries”, “Engineering Analysis”, “Basic Engineering Analysis and Measurement I”, or “Basic Engineering Analysis and Measurement II” among the “Common Subjects for International Students” are to be included in the total credits.</li> </ol>
Aeronautics and Astronautics	<ol style="list-style-type: none"> <li>1. Twelve or more credits from “Advanced Subjects” and “Advanced Specialized Subjects” are to be included in the total credits.</li> <li>2. Four or more credits from “Professional Skill Development” are to be included in the total credits.</li> </ol>
Applied Quantum Physics and Nuclear Engineering	<ol style="list-style-type: none"> <li>1. Six or more credits from “Advanced Subjects” are to be included in the total credits.</li> <li>2. Six or more credits from “Advanced Specialized Subjects” are to be included in the total credits.</li> <li>3. Four or more credits from “Professional Skill Development” are to be included in the total credits.</li> <li>4. Four or more credits from “Additional Specialized Subjects” or “Cross-disciplinary Courses” are to be included in the total credits.</li> </ol>
Earth Resources Engineering	<ol style="list-style-type: none"> <li>1. Six or more credits from “Advanced Subjects” are to be included in the total credits.</li> <li>2. Six or more credits from “Advanced Specialized Subjects” are to be included in the total credits.</li> <li>3. Two or more credits from “Professional Skill Development” are to be included in the total credits.</li> </ol>
Naval Architecture and Ocean Engineering	<ol style="list-style-type: none"> <li>1. Six or more credits from “Advanced Subjects” are to be included in the total credits.</li> <li>2. Six or more credits from “Advanced Specialized Subjects” are to be included in the total credits.</li> <li>3. Two or more credits from “Professional Skill Development” are to be included in the total credits.</li> </ol>

Civil Engineering	<ol style="list-style-type: none"> <li>1. Six or more credits from “Advanced Subjects” are to be included in the total credits.</li> <li>2. Six or more credits from “Advanced Specialized Subjects” are to be included in the total credits.</li> <li>3. Six or more credits from “Professional Skill Development” are to be included in the total credits.</li> </ol>
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\*1: “Required Specialized Courses” refers to the subjects offered by the Master’s Program of the department in which the student is enrolled.

\*2: “Cross-disciplinary Courses” refers to the subjects offered by other departments and the “Common Subjects for International Students”. These subjects are to be chosen in consultation with the student’s supervisor.

# 履修の手引き

## 工学府 グローバルコース 修士課程

各コースごとに、修士課程に2年以上在籍し、以下に掲げる単位及びその他の関連授業科目により30単位以上を修得し、かつ、必要な研究指導を受けた上、修士論文の審査及び最終審査に合格すること。

コース名	コース授業科目と関連授業科目の単位
材料工学	1. 高等専門科目から4単位以上 2. 先端科目から2単位以上 3. 能力開発特別科目から4単位以上
応用化学	この場合において、応用化学グローバルコースにあつては、「応用化学情報集約演習」、「応用化学コミュニケーション第一」及び「応用化学学生セミナー第一」のうちから4単位以上修得しなければならない。
化学工学	
機械工学	1. 高等専門科目及び先端科目6分野の選択必修科目のうち少なくとも5分野から各1科目ずつ、10単位以上 2. 能力開発特別科目から6単位以上  ※機械工学グローバルコースの科目の他に、学府履修の手引き冊子に記載され機械工学コースで開講されている科目で指導教員が指定する授業科目も履修できる。ただし、機械工学コースの科目の多くは日本語で開講されている。また、ENG-MCE1111JとENG-MCE1111Eなどのような同じ番号の重複は認められない。
水素エネルギーシステム	1. 高等専門科目から10単位以上 2. 先端科目から2単位以上 3. 能力開発特別科目から2単位以上 4. 外国人留学生に共通の授業科目において、「Advanced Japanese Industries(日本産業論)」、「Engineering Analysis(工学解析特論)」、「Basic Engineering Analysis and Measurement I(工学解析・計測特論I)」及び「Basic Engineering Analysis and Measurement II(工学解析・計測特論II)」のうちから2単位以上
航空宇宙工学	1. 高等専門科目及び先端科目から12単位以上 2. 能力開発特別科目から4単位以上

量子物理工学	<ol style="list-style-type: none"> <li>1. 高等専門科目から6単位以上</li> <li>2. 先端科目から6単位以上</li> <li>3. 能力開発特別科目から4単位以上</li> <li>4. 広域専門科目及び関連授業科目から4単位以上</li> </ol>
地球資源システム工学	<ol style="list-style-type: none"> <li>1. 高等専門科目から6単位以上</li> <li>2. 先端科目から6単位以上</li> <li>3. 能力開発特別科目から2単位以上</li> </ol>
船舶海洋工学	<ol style="list-style-type: none"> <li>1. 高等専門科目から6単位以上</li> <li>2. 先端科目から6単位以上</li> <li>3. 能力開発特別科目から2単位以上</li> </ol>
土木工学	<ol style="list-style-type: none"> <li>1. 高等専門科目から6単位以上</li> <li>2. 先端科目から6単位以上</li> <li>3. 能力開発特別科目から6単位以上</li> </ol>

\*当該コースの修士課程で定められた授業科目をコース授業科目といい、その他の授業科目で指導教員が指定する授業科目（外国人留学生に共通の授業科目を含む。）を関連授業科目という。

# Program Requirements

## International Doctoral Programs Graduate School of Engineering

A student shall be required to:

- be enrolled in the program for at least three years;
- acquire at least 10 credits from “Required Specialized Courses”<sup>\*1</sup> and “Cross-disciplinary Courses”<sup>\*2</sup> by meeting the specific requirements listed below;
- undertake guided research; and
- pass the thesis examination.

Programs	Requirements
Materials	Four or more credits from “Research Subjects” which are conducted by the student’s supervisor <sup>*3</sup> and two credits from “Engineering Research Planning” are to be included in the total credits.
Applied Chemistry	Four or more credits from “Research Subjects” which are conducted by the student’s supervisor <sup>*3</sup> , two credits from “Research Planning Exercises in Applied Chemistry” and two credits from “Engineering Research Planning” are to be included in the total credits.
Chemical Engineering	Four or more credits from “Research Subjects” which are conducted by the student’s supervisor <sup>*3</sup> and two credits from “Engineering Research Planning” are to be included in the total credits.
Mechanical Engineering	
Hydrogen Energy Systems	<ol style="list-style-type: none"> <li>1. Two credits from “Advanced Hydrogen Energy Engineering” are to be included in the total credits.</li> <li>2. Two credits from “Project Analysis” are to be included in the total credits.</li> <li>3. Two credits from, “International Internship I”, “International Internship II” or “Internship” are to be included in the total credits.</li> <li>4. Two credits from “Training as Supervisor” are to be included in the total credits.</li> <li>5. Two credits from “Engineering Research Planning” are to be included in the total credits.</li> </ol> <p>For “Engineering Research Planning” related to those who enrolled in the examination for Working Adults, the instructions of the student’s supervisor shall be followed.</p>
Aeronautics and Astronautics	Four or more credits from “Research Subjects” which are conducted by the student’s supervisor <sup>*3</sup> and two credits from “Engineering Research Planning” are to be included in the total credits.
Applied Quantum Physics and Nuclear Engineering	
Naval Architecture and Ocean Engineering	
Earth Resources Engineering	
Civil Engineering	

\*1: “Required Specialized Courses” refers to the subjects offered by the Doctoral Program of the department in which the student is enrolled.

\*2: “Cross-disciplinary Courses” refers to the subjects offered by other departments. These subjects are to be chosen in consultation with the student’s supervisor.

\*3: The subjects conducted by a student’s supervisor are referred to as “Major Research Subjects”.

# 履修の手引き

## 工学府 博士後期課程

各コースごとに、博士後期課程に3年以上在籍し、コース授業科目及び関連授業科目から合わせて10単位以上を修得し、かつ、必要な研究指導を受けた上、博士論文の審査及び最終審査に合格すること。修得する10単位は以下の条件を満たさなければならない。

コース名	コース授業科目と関連授業科目の単位
材料工学	主分野科目のうち講究科目4単位以上及び工学研究企画2単位
応用化学	主分野科目のうち講究科目4単位以上及び 応用化学研究企画演習2単位及び工学研究企画2単位
化学工学	主分野科目のうち講究科目4単位以上及び工学研究企画2単位
機械工学	
水素エネルギーシステム	1. 水素エネルギー工学特論2単位 2. プロジェクト演習2単位 3. 国際連携インターンシップI、国際連携インターンシップII 及び産学連携インターンシップのうちから2単位 4. 水素エネルギーシステム指導演習2単位 5. 工学研究企画2単位 なお、社会人特別選抜試験で入学した者に関する工学研究企画については、指導教員の指示に従うものとする。
航空宇宙工学 量子物理工学 船舶海洋工学 地球資源システム工学 土木工学	主分野科目のうち講究科目4単位以上及び工学研究企画2単位

\*当該コースの博士課程で定められた授業科目をコース授業科目といい、その他の授業科目で指導教員が指定する授業科目を関連授業科目という。この場合においてコース授業科目のうち、指導教員が開講するものを主分野科目という。



Subject (授業科目)

Master's Programs (修士課程)

International Master's Program in Materials

材料工学グローバルコース

Category 分類	Subject 授業科目	Credit(s) 単位	Term 割り当て時間								
			1st year				2nd year				
			Fall	Winter	Spring	Summer	Fall	Winter	Spring	Summer	
Advanced Subjects 高等専門科目	Theory of Reaction Rate for Pyrometallurgy (高温反応工学)	2		4							
	Physical Chemistry of Melts (融体物理化学)	2	4								
	Theory of Crystal Growth (結晶成長制御学)	2				4					
	Engineering of Heat Resistant Materials (耐熱材料工学)	2		4							
	Electrochemical Engineering for Hydrometallurgy (電解反応工学)	2		4							
	Microstructure Analysis of Materials (材料組織解析学)	2			4						
	Engineering of Structural Materials (構造材料工学)	2		4							
	Advanced Semiconductor Materials (半導体材料制御学)	2				4					
	Applied Thin-Film Technology (応用薄膜工学)	2			4						
	Physical chemistry of solids (欠陥物理化学)	2			4						
	Principles of Semiconductor devices (半導体デバイス特論)	2			4						
	Plastic Deformation of Materials (材料変形および加工学)	2			4						
Advanced Specialized Subjects 先端科目	Reaction Control for Materials Processing (材料反応制御学)	2				4					
	Physical Properties of Melts (融体物性工学)	2	4								
	Science of Composite Materials (複合材料学)	2	4								
	Science of Metal Fracture (金属破壊学)	2				4					
	Electron Microscopy for Materials (電子線解析学)	2		4							
	Heat Treatment of Metals (熱処理論)	2		4							
	Advanced Surface Science and Technology (表面機能制御学)	2	4								
	Metal Resource Recycling Engineering (金属資源循環工学)	2	4								
	Electronic Device (電子デバイス材料特論)	2		4							
	Advanced Course of Powder Metallurgy (粉末冶金学)	2				4					
Professional Skill Development 能力開発特別科目	Integrations of Information on Materials (A) (材料工学情報集約演習A)	2	2								
	Integrations of Information on Materials (B) (材料工学情報集約演習B)	2	2								
	Integrations of Information on Materials (C) (材料工学情報集約演習C)	2	2								
	Integrations of Information on Materials (D) (材料工学情報集約演習D)	2	2								
	Integrations of Information on Materials (E) (材料工学情報集約演習E)	2	2								
	Integrations of Information on Materials (F) (材料工学情報集約演習F)	2	2								
	Integrations of Information on Materials (G) (材料工学情報集約演習G)	2	2								
	Integrations of Information on Materials (H) (材料工学情報集約演習H)	2	2								
	Integrations of Information on Materials (I) (材料工学情報集約演習I)	2	2								
	Integrations of Information on Materials (J) (材料工学情報集約演習J)	2	2								
	Integrations of Information on Materials (K) (材料工学情報集約演習K)	2	2								
	Integrations of Information on Materials (L) (材料工学情報集約演習L)	2	2								

Category 分類	Subject 授業科目	Credit(s) 単位	Term 割り当て時間							
			1st year				2nd year			
			Fall	Winter	Spring	Summer	Fall	Winter	Spring	Summer
Professional Skill Development 能力開発特別科目	Advanced Lectures on Material Technologies (材料工学特別講義)	2	2							
	Industrial Job Training (産学連携インターンシップ)	2	2							
	Lectures on Industry-Academia Collaboration (産学連携講義)	2	2							
	Research Planning in Materials (材料工学企画演習)	2	2							
	Advanced Course in Materials (A) (材料工学特論A)	1	1							
	Advanced Course in Materials (B) (材料工学特論B)	1	1							

# International Master's Program in Applied Chemistry

応用化学グローバルコース

Category 分類	Subject 授業科目	Credit(s) 単位	Term 割り当て時間												
			1st year				2nd year								
			Fall	Winter	Spring	Summer	Fall	Winter	Spring	Summer					
Advanced Subjects 高等専門科目	Inorganic Solid State Chemistry (無機固体化学)	2	2												
	Materials Properties of Ceramics (セラミック材料物性学)	2						2							
	Organic Reaction Chemistry (有機反応化学)	2										2			
	Organic Functional Chemistry (有機機能化学)	2	2												
	Organic Solid State Photophysics (有機固体光電子物性)	2										2			
	Organic Electronics and Photonics (有機光エレクトロニクス)	2						2							
	Polymer Synthesis and Reaction (高分子合成反応論)	2			2										
	Molecular Electronic Structures (分子電子構造論)	2			2							2			
	Molecular Solid State Theory (分子固体物性論)	2						2							
	Physical Properties of Polymers (高分子物性学)	2	2												
	Analysis of Material Properties (材料物性解析学)	2										2			
	Applied Surface Chemistry (応用表面化学)	2						2							
	Chemical Reaction Control (化学反応制御学)	2						2							
	Nano-Micro Science (ナノ・マイクロ科学)	2										2			
	Applied Laser Engineering (応用レーザー工学)	2	2												
	NanoBio Electroanalytical Chemistry (ナノバイオ電気分析化学)	2						2							
	Chemistry of Molecular radical (分子ラジカル化学)	2						2							
	Chemistry of Small Molecules (小分子の化学)	2	2					2							
	Molecular Organization Chemistry (分子組織化学)	2						2							
	Molecular design of surface nanostructures (ナノ構造分子設計論)	2			2							2			
	Nano-Structure Analysis (ナノ構造分析学特論)	2										2			
	Biomolecular Engineering (生体分子工学)	2	2												
	Molecular Cell Biology (分子細胞生物学)	2			2							2			
	Biocatalysis Chemistry (生体触媒化学)	2	2					2							
	Advanced Specialized Subjects 先端科目	Ceramic Engineering (セラミック工学)	2											2	
Organic Structural Chemistry (有機構造化学)		2			2										
Functional Molecular Materials Engineering (機能分子材料工学)		2	2												
Design of Quantum Materials (量子材料設計学)		2	2												
Physical and Chemical Properties of Materials (材料物性化学)		2						2							
Functional Materials Engineering (機能物質工学)		2	2												
Bio-Analytical Chemistry (バイオ分析化学)		2	2												
Bioinorganic Chemistry (生物無機化学)		2			2										
Chemistry of Catalytic Materials Transformations (触媒の物質変換化学)		2			2							2			
Molecular Systems Chemistry (分子システム化学)		2	2												
Bioengineering (バイオエンジニアリング特論)		2						2							
Nanomaterials Chemical Analysis (ナノ物質機能解析学特論)		2			2										
Advanced Cell Manipulation Engineering (細胞操作工学特論)		2	2					2							
Regenerative Medical Engineering (再生医工材料学)		2			2							2			
Biomaterials Science (バイオマテリアルサイエンス)		2	2					2							
	Exercises of Reference Search (応用化学情報集約演習)	4					1								
	Student Seminar in Applied Chemistry (1) (応用化学学生セミナー第一)	2			1										
	Student Seminar in Applied Chemistry (2) (応用化学学生セミナー第二)	2							1						
	Communication Training in Applied Chemistry (1) (応用化学コミュニケーション第一)	2			1										

Professional Skill Development 能力開発特別科目	Communication Training in Applied Chemistry (2) (応用化学コミュニケーション第二)	2					1
	Industry-Academia Collaborations in Research and Development I (産学連携特論第一)	2			2		
	Industry-Academia Collaborations in Research and Development II (産学連携特論第二)	2	2				
	Industry-Academia Collaborations in Research and Development III (産学連携特論第三)	2					2
	Industry-Academia Collaborations in Research and Development IV (産学連携特論第四)	2				2	
	Industry-Academia Collaborations in Research and Development V (産学連携特論第五)	2		1			
	Industry-Academia Collaborations in Research and Development VI (産学連携特論第六)	2					1
	Industrial Job Training 1 (企業インターンシップ第一)	2		1			
	Industrial Job Training 2 (企業インターンシップ第二)	2					1
	International Collaborations Training (国際連携実習)	2		1			
	International Scientific English Training (国際科学英語実習)	2	2			2	
	colloquium in Functional Materials Chemistry (1) (機能物質化学コロキウムI)	2			2		
	colloquium in Functional Materials Chemistry (2) (機能物質化学コロキウムII)	2	2				
	colloquium in Functional Materials Chemistry (3) (機能物質化学コロキウムIII)	2					2
	colloquium in Functional Materials Chemistry (4) (機能物質化学コロキウムIV)	2				2	
	colloquium in Molecular Life Science and Engineering (1) (分子生命工学コロキウムI)	2			2		
	colloquium in Molecular Life Science and Engineering (2) (分子生命工学コロキウムII)	2	2				
	colloquium in Molecular Life Science and Engineering (3) (分子生命工学コロキウムIII)	2					2
	colloquium in Molecular Life Science and Engineering (4) (分子生命工学コロキウムIV)	2				2	
	Advanced Course in Functional Materials Chemistry (1) (機能物質化学特論第一)	2					1
	Advanced Course in Functional Materials Chemistry (2) (機能物質化学特論第二)	2					1
	Advanced Course in Functional Materials Chemistry (3) (機能物質化学特論第三)	2					1
	Advanced Course in Functional Materials Chemistry (4) (機能物質化学特論第四)	2					1
	Advanced Course in Functional Materials Chemistry (5) (機能物質化学特論第五)	2					1
	Advanced Course in Functional Materials Chemistry (6) (機能物質化学特論第六)	2					1
	Advanced Course in Functional Materials Chemistry (7) (機能物質化学特論第七)	2					1
	Advanced Course in Functional Materials Chemistry (8) (機能物質化学特論第八)	2					1
	Advanced Course in Chemistry and Biochemistry (9) (機能物質化学特論第九)	2					1
	Advanced Course in Chemistry and Biochemistry (10) (機能物質化学特論第十)	2					1
	Advanced Course in Chemistry and Biochemistry (11) (機能物質化学特論第十一)	2					1
	Advanced Course in Chemistry and Biochemistry (12) (機能物質化学特論第十二)	2					1
	Exercises in Functional Materials Chemistry (1) (機能物質化学演習第一)	2					1
	Exercises in Functional Materials Chemistry (2) (機能物質化学演習第二)	2					1
	Exercises in Functional Materials Chemistry (3) (機能物質化学演習第三)	2					1
	Exercises in Functional Materials Chemistry (4) (機能物質化学演習第四)	2					1
	Exercises in Functional Materials Chemistry (5) (機能物質化学演習第五)	2					1
	Exercises in Functional Materials Chemistry (6) (機能物質化学演習第六)	2					1
	Exercises in Functional Materials Chemistry (7) (機能物質化学演習第七)	2					1
	Exercises in Functional Materials Chemistry (8) (機能物質化学演習第八)	2					1
	Exercises in Functional Materials Chemistry (9) (機能物質化学演習第九)	2					1
	Exercises in Functional Materials Chemistry (10) (機能物質化学演習第十)	2					1
	Exercises in Functional Materials Chemistry (11) (機能物質化学演習第十一)	2					1
	Exercises in Functional Materials Chemistry (12) (機能物質化学演習第十二)	2					1
Advanced Course in Molecular Life Science and Engineering (1) (分子生命工学特論第一)	2					1	
Advanced Course in Molecular Life Science and Engineering (2) (分子生命工学特論第二)	2					1	
Advanced Course in Molecular Life Science and Engineering (3) (分子生命工学特論第三)	2					1	
Advanced Course in Molecular Life Science and Engineering (4) (分子生命工学特論第四)	2					1	

Professional Skill Development 能力開発特別科目	Advanced Course in Molecular Life Science and Engineering (5) (分子生命工学特論第五)	2					1
	Advanced Course in Molecular Life Science and Engineering (6) (分子生命工学特論第六)	2					1
	Advanced Course in Molecular Life Science and Engineering (7) (分子生命工学特論第七)	2					1
	Advanced Course in Molecular Life Science and Engineering (8) (分子生命工学特論第八)	2					1
	Advanced Course in Molecular Life Science and Engineering (9) (分子生命工学特論第九)	2					1
	Advanced Course in Molecular Life Science and Engineering (10) (分子生命工学特論第十)	2					1
	Advanced Course in Molecular Life Science and Engineering (11) (分子生命工学特論第十一)	2					1
	Advanced Course in Molecular Life Science and Engineering (12) (分子生命工学特論第十二)	2					1
	Exercises in Molecular Life Science and Engineering (1) (分子生命工学演習第一)	2					1
	Exercises in Molecular Life Science and Engineering (2) (分子生命工学演習第二)	2					1
	Exercises in Molecular Life Science and Engineering (3) (分子生命工学演習第三)	2					1
	Exercises in Molecular Life Science and Engineering (4) (分子生命工学演習第四)	2					1
	Exercises in Molecular Life Science and Engineering (5) (分子生命工学演習第五)	2					1
	Exercises in Molecular Life Science and Engineering (6) (分子生命工学演習第六)	2					1
	Exercises in Molecular Life Science and Engineering (7) (分子生命工学演習第七)	2					1
	Exercises in Molecular Life Science and Engineering (8) (分子生命工学演習第八)	2					1
	Exercises in Molecular Life Science and Engineering (9) (分子生命工学演習第九)	2					1
	Exercises in Molecular Life Science and Engineering (10) (分子生命工学演習第十)	2					1
	Exercises in Molecular Life Science and Engineering (11) (分子生命工学演習第十一)	2					1
	Exercises in Molecular Life Science and Engineering (12) (分子生命工学演習第十二)	2					1
Additional Specialized Subjects 広域専門科目	Topics in Science and Technology (科学技術論)	2			2		2
	Advanced Chemistry for Functional Materials (機能物質化学特論)	2			2		2
	Advanced Chemistry for Molecular Systems (分子システム化学特論)	2			2		2

# International Master's Program in Chemical Engineering

## 化学工学グローバルコース

Category 分類	Subject 授業科目	Credit(s) 単位	Term 割り当て時間								
			1st year				2nd year				
			Fall	Winter	Spring	Summer	Fall	Winter	Spring	Summer	
Advanced Subjects 高等専門科目	Advanced Heat Transfer Engineering (熱移動工学特論)	2			4						
	Physical Chemistry for Engineering (物理化学特論)	2			4						
	Bioprocess Engineering A (生物プロセス工学特論A)	1			2						
	Bioprocess Engineering B (生物プロセス工学特論B)	1				2					
	Advanced Process Systems Engineering (プロセスシステム工学特論)	2				4					
	Engineering Rheology (レオロジー工学)	2				4					
	Engineering of Biomimetic Functional Materials (生体模倣機能材料工学)	2		4							
	Advanced Chemical Reaction Engineering (反応工学特論)	2			4						
	Advanced Mass Transfer Engineering (物質移動工学特論)	2	4								
Advanced Specialized Subjects 先端科目	Bio-resource Materials Engineering (生体由来材料工学)	2			4						
	Introduction to Soft Matter Processing (高分子プロセス工学)	2				4					
	Environmental Fluid Transport Phenomena (環境流体輸送現象論)	2				4					
	Electrochemical Systems Engineering (電気化学システム工学)	2	4								
	Combustion System Engineering (燃焼システム工学)	2	4								
	Biomaterials Engineering (生命材料工学)	2		4							
	Cell & Tissue Engineering A (細胞・組織工学A)	1	2								
	Cell & Tissue Engineering B (細胞・組織工学B)	1		2							
	Functional Materials Chemistry (機能表面化学)	2		4							
	Biological System Engineering (生物機能システム工学)	2			4		4				
	Advanced Topics in Chemical Engineering (化学工学先端技術特論)	2	4								
Professional Skill Development 能力開発特別科目	Communication in Chemical Engineering I (化学工学コミュニケーションI)	2			1						
	Student Seminar of Chemical Engineering I (化学工学学生セミナーI)	2			1						
	Communication in Chemical Engineering II (化学工学コミュニケーションII)	2							1		
	Student Seminar of Chemical Engineering II (化学工学学生セミナーII)	2							1		
	Excercises of Reference Search in Chemical Engineering (化学工学情報集約演習)	2							1		
Additional Specialized Subjects 広域専門科目	Material Science and Engineering I (物質科学工学I)	2		2							
	Material Science and Engineering II (物質科学工学II)	2						2			

# International Master's Program in Mechanical Engineering

## 機械工学 グローバルコース

Category 分類	Subject 授業科目	Credit(s) 単位	Term 割り当て時間								
			1st year				2nd year				
			Fall	Winter	Spring	Summer	Fall	Winter	Spring	Summer	
Advanced Subjects 高等専門科目	Advanced Heat and Mass Transfer ( AREA 2 ) A	1			1						
	Advanced Heat and Mass Transfer ( AREA 2 ) B	1				1					
	Reactive Gas Dynamics ( AREA 2 ) (反応性ガス力学)	2			2						
	Mechanical Vibration ( AREA 4 ) (振動工学)	1			1						
	Mechanical Acoustics ( AREA 4 ) (機械音響工学)	1				1					
	Computational Intelligence ( AREA 5 ) (計算知能)	2			2						
	Advanced Robotics ( AREA 5 ) (先端ロボット工学)	2		2							
	Theory of Plasticity ( AREA 6 ) (塑性変形論)	2		2							
Advanced Specialized Subjects 先端科目	Fracture Mechanics ( AREA 1 ) (破壊力学)	2			2						
	Gas Dynamics ( AREA 3 ) (気体力学)	2		2							
Professional Skill Development 能力開発特別科目	Seminar in Mechanical Engineering I (機械工学セミナー I)	1			2						
	Seminar in Mechanical Engineering I I (機械工学セミナー I I)	1		2							
	Mechanical Engineering Internship I (機械工学インターンシップ I)	1			2						
	Mechanical Engineering Internship I I (機械工学インターンシップ I I)	1		2							
	Communication for Mechanical Engineer I (機械工学コミュニケーション I)	1			2						
	Communication for Mechanical Engineer I I (機械工学コミュニケーション I I)	1		2							
	Investigation on Mechanical Engineering (機械工学情報集約)	2									2

# International Master's Program in Hydrogen Energy Systems

## 水素エネルギーシステム グローバルコース

Category 分類	Subject 授業科目	Credit(s) 単位	Term 割り当て時間								
			1st year				2nd year				
			Fall	Winter	Spring	Summer	Fall	Winter	Spring	Summer	
Advanced Subjects 高等専門科目	Hydrogen Energy Engineering (水素エネルギー工学)	2	2								
	Clean Energy Technologies (クリーンエネルギー技術特論)	2	2								
	Tribology (トライボロジー)	2			2						
	Advanced Heat and Mass Transfer A (先端熱物質移動論 A)	1			1						
	Advanced Heat and Mass Transfer B (先端熱物質移動論 B)	1				1					
	Reactive Gas Dynamics (反応性ガス力学)	2			2						
	Mechanical Vibration (振動工学)	1			1						
	Mechanical Acoustics (機械音響工学)	1				1					
	Computational Intelligence (計算知能)	2			2						
	Fuel Cell Engineering (燃料電池工学)	2	2								
	Hydrogen Production and Storage (水素製造・貯蔵)	2	2								
	High Pressure Gas Safety Engineering (高圧ガス安全工学)	2	2								
Advanced Specialized Subjects 先端科目	Fracture Mechanics (破壊力学)	2			2						
	Advanced Energy Engineering I (先端エネルギー特論 I)	2	2						2		
	Advanced Energy Engineering II (先端エネルギー特論 II)	2			2		2				
Professional Skill Development 能力開発特別科目	Seminar on Hydrogen Engineering I (水素工学セミナー I)	1			1						
	Seminar on Hydrogen Engineering II (水素工学セミナー II)	1	1								
	Internship for Hydrogen Engineering I (水素工学インターンシップ I)	1			1						
	Internship for Hydrogen Engineering II (水素工学インターンシップ II)	2	2								
	Communication for Hydrogen Engineer I (水素工学コミュニケーション I)	1							2		
	Communication for Hydrogen Engineer II (水素工学コミュニケーション II)	1					2				
	Investigation Study on Hydrogen Engineering (水素工学情報集約)	2							2		



# International Master's Program in Aeronautics and Astronautics

## 航空宇宙工学グローバルコース

Category 分類	Subject 授業科目	Credit(s) 単位	Term 割り当て時間			
			1st year		2nd year	
			Fall	Spring	Fall	Spring
Advanced Subjects 高等専門科目	Internal Flow (内部流れ)	2	2			
	Aeroelasticity (空力弾性学)	2	2			
	Mechanics of Composite Materials (複合材料力学)	2		2		
	Advanced Guidance and Control I (誘導制御特論 I)	2	2			
	Advanced Guidance and Control II (誘導制御特論II)	2		2		
	Applied Flight Dynamics (応用飛行力学)	2	2			
	Spacecraft Dynamics (宇宙機動力学)	2	2			
	Reusable Launch Vehicle Engineering (宇宙往還機工学)	2	2			
	ReEntry Dynamics (再突入力学)	2		2		
	Advanced Aerospace Vehicle Design (航空宇宙機設計特論)	2	2			
	Space Utilization (宇宙利用システム工学)	2	2			
	Functional Material Engineering (機能材料工学)	2		2		
	Computational Structural Mechanics (数値構造力学)	2		2		
	Materials for Aerospace (航空宇宙材料)	2	2			
Advanced Specialized Subjects 先端科目	Applied Fluid Dynamics (応用流体力学)	2		2		
	Applied Thermophysical Engineering (応用熱物理学)	2		2		
	Introduction to Dynamical Systems (動的システム序論)	2	2			
Professional Skill Development 能力開発特別科目	Seminar in Aeronautics and Astronautics I (航空宇宙工学演習 I)	2	2	2		
	Seminar in Aeronautics and Astronautics II (航空宇宙工学演習 II)	2			2	2
	Laboratory Experiments on Aeronautics and Astronautics (航空宇宙工学研究実験)	2			2	2
	Internship in Aerospace Engineering I (航空宇宙工学インターンシップ I)	1	2			
	Internship in Aerospace Engineering II (航空宇宙工学インターンシップ II)	1		2		
	Communication for Aerospace Engineers I (航空宇宙工学コミュニケーション I)	1	2			
	Communication for Aerospace Engineers II (航空宇宙工学コミュニケーション II)	1		2		
	Aerospace Engineering Project I (航空宇宙工学プロジェクト I)	2	2			
Aerospace Engineering Project II (航空宇宙工学プロジェクト II)	2		2			

**International Master's Program  
in Applied Quantum Physics and Nuclear Engineering**  
量子物理工学グローバルコース

Category 分類	Subject 授業科目	Credit(s) 単位	Term 割り当て時間			
			1st year		2nd year	
			Fall	Spring	Fall	Spring
Advanced Subjects 高等専門科目	Nuclear Fuel Engineering (核燃料工学)	2	2			
	Environmental Sciences and Engineering (環境科学・工学)	2		2		
	Nuclear Physics and Measurement (原子核物理計測学)	2		2		
	Radiation Physics and Measurement (放射線物理計測学)	2	2			
	Sciences and Engineering of Organic Materials Property (有機物性工学)	2		2		
	Experimental Practice on Nuclear Engineering (原子力工学基礎実験)	2		2		
	High-Energy Nuclear Reaction (高エネルギー核反応論)	2		2		
	Numerical Simulation for Radiation Engineering (放射線数値シミュレーション)	1		2		
Advanced Specialized Subjects 先端科目	Nuclear Reaction and Accelerator (原子核反応及び加速器学)	2	2			
	Lattice Defects in Materials (格子欠陥学)	2		2		
	Environment-Improving Material Engineering (環境機能材料工学)	2				2
	Fusion Plasma Science (核融合プラズマ科学)	2	2			
	Thin Film and Surface Physics (薄膜表面物理学)	2				2
	Radiation Effects in Nuclear Materials (原子力材料物性学)	2	2			
	Fudamental Aspects of Nuclear Fuel Cycle (核燃料サイクル工学)	2	2			
	Multiphase Flow Science in Energy Engineering (エネルギー混相流体工学)	2		2		
	Nuclear Reactor System Engineering (原子炉システム工学)	2			2	
	Applied Low Temperature Physics (応用低温物理学)	2				2
	Solid State Physics (物性物理学)	2			2	
	Professional Skill Development 能力開発特別科目	Nuclear and Radiation Engineering Laboratory I (原子核・量子線工学実験I)	2			2
Nuclear and Radiation Engineering Laboratory II (原子核・量子線工学実験II)		2			2	2
Materials Science for Energy Systems Laboratory I (エネルギー物質科学実験I)		2			2	2
Materials Science for Energy Systems Laboratory II (エネルギー物質科学実験II)		2			2	2
Materials Science for Energy Systems Laboratory III (エネルギー物質科学実験III)		2			2	2
Nuclear Energy Systems Laboratory I (核エネルギーシステム学実験 I)		2			2	2
Nuclear Energy Systems Laboratory II (核エネルギーシステム学実験 II)		2			2	2

Professional Skill Development 能力開発特別科目	Nuclear Energy Systems Laboratory III (核エネルギーシステム学実験Ⅲ)	2			2	2
	Applied Physics Laboratory I (応用物理学実験I)	2			2	2
	Applied Physics Laboratory II (応用物理学実験II)	2			2	2
	Applied Physics Laboratory III (応用物理学実験Ⅲ)	2			2	2
	Laboratory and Presentation for Nuclear and Radiation Engineering I (原子核・量子線工学発表演習I)	2			2	2
	Laboratory and Presentation for Nuclear and Radiation Engineering II (原子核・量子線工学発表演習II)	2			2	2
	Laboratory and Presentation for Materials Science for Energy Systems I (エネルギー物質科学発表演習I)	2			2	2
	Laboratory and Presentation for Materials Science for Energy Systems II (エネルギー物質科学発表演習II)	2			2	2
	Laboratory and Presentation for Materials Science for Energy Systems III (エネルギー物質科学発表演習Ⅲ)	2			2	2
	Laboratory and Presentation for Nuclear Energy Systems I (核エネルギーシステム学発表演習I)	2			2	2
	Laboratory and Presentation for Nuclear Energy Systems II (核エネルギーシステム学発表演習II)	2			2	2
	Laboratory and Presentation for Nuclear Energy Systems III (核エネルギーシステム学発表演習Ⅲ)	2			2	2
	Laboratory and Presentation for Applied Physics I (応用物理学発表演習I)	2			2	2
	Laboratory and Presentation for Applied Physics II (応用物理学発表演習II)	2			2	2
	Laboratory and Presentation for Applied Physics III (応用物理学発表演習Ⅲ)	2			2	2
	Additional Specialized Subjects 広域専門科目	Research Project in Nuclear and Radiation Engineering I (原子核・量子線工学研究計画演習I)	2	2	2	
Research Project in Nuclear and Radiation Engineering II (原子核・量子線工学研究計画演習II)		2	2	2		
Research Project in Materials Science for Energy Systems I (エネルギー物質科学研究計画演習I)		2	2	2		
Research Project in Materials Science for Energy Systems II (エネルギー物質科学研究計画演習II)		2	2	2		
Research Project in Materials Science for Energy Systems III (エネルギー物質科学研究計画演習Ⅲ)		2	2	2		
Research Project in Nuclear Energy Systems I (核エネルギーシステム学研究計画演習I)		2	2	2		
Research Project in Nuclear Energy Systems II (核エネルギーシステム学研究計画演習II)		2	2	2		
Research Project in Nuclear Energy Systems III (核エネルギーシステム学研究計画演習Ⅲ)		2	2	2		
Research Project in Applied Physics I (応用物理学計画演習I)		2	2	2		
Research Project in Applied Physics II (応用物理学計画演習II)		2	2	2		
Research Project in Applied Physics III (応用物理学計画演習Ⅲ)		2	2	2		

Additional Specialized Subjects 広域専門科目	Scientific Presentation and Communication (科学技術コミュニケーション)	1		1		
	Experimental Practice on Nuclear Fuel Cycle I (核燃料サイクル実験I)	1		2		
	Experimental Practice on Nuclear Fuel Cycle II (核燃料サイクル実験II)	1			2	
	Laboratory and Presentation for Industrial Fields I (産学連携演習I)	1		1		
	Laboratory and Presentation for Industrial Fields II (産学連携演習II)	1		1		
	Laboratory and Presentation for Industrial Fields III (産学連携演習III)	1		1		
	Seminar in Quantum Physics (量子物理特別講義)	1		1		

## International Master's Program in Naval Architecture and Ocean Engineering

### 船舶海洋工学グローバルコース

Category 分類	Subject 授業科目	Credit(s) 単位	Term 割り当て時間							
			1st year				2nd year			
			Fall	Winter	Spring	Summer	Fall	Winter	Spring	Summer
Advanced Subjects 高等専門科目	Introduction of Naval Architecture and Ocean Engineering I (船舶海洋工学概論第一)	2			2	2				
	Introduction of Naval Architecture and Ocean Engineering II (船舶海洋工学概論第二)	2	2	2						
	Advanced Theory of Ship Resistance and Propulsion (船舶抵抗推進特論)	2			2	2				
	Applied Risk Analysis (応用リスク解析学)	2			2	2				
	Introduction to Industrial and Applied Mathematics (応用数学)	2			2	2				
	Advanced Course of Ship Preliminary Design (船舶基本設計特論)	2			2	2				
	Advanced Structural Mechanics of Ship and Marine Structures (船舶海洋構造力学特論)	2			2	2				
	Advanced Course of Offshore Structure Engineering (海洋浮体工学特論)	2			2	2				
	Welding Design I (溶接設計第一)	2			4					
	Welding Design II (溶接設計第二)	2				4				
Cooperative Lecture on International Ocean Development I (国際海洋開発連携講義第一)	4									
Advanced Specialized Subjects 先端科目	Advanced Course in Fracture Control Design (破壊管理工学特論)	2	2	2						
	Advanced Course of Dynamics of Ships (船舶運動特論)	2	2	2						
	Information Technology for Ship and Marine Structures (船舶海洋情報学)	2			2	2				
	Application of Energy from the Ocean (海洋エネルギー利用計画)	2	2	2						
	Advanced Theory of Vibration for Ship and Marine Structures (船舶海洋振動学特論)	2	2	2						
	Advanced Course of Systems Optimization (システム最適化特論)	2	2	2						
	Cooperative Lecture on International Ocean Development II (国際海洋開発連携講義第二)	4								
Professional Skill Development 能力開発特別科目	Advanced Civil and Environmental Engineering (地球環境工学特論)	2								
	Practice in Civil and Environmental Engineering (地球環境工学演習)	2								
	Practice in Environmental Studies (環境学実習)	2			2	2				
	Seminar of Naval Architecture and Ocean Engineering (船舶海洋工学演習)	2								
	Problem-Solution Seminar (課題解決セミナー)	2		4						
	Internship Program (インターンシップ・プログラム)	2								

# International Master's Program in Earth Resources Engineering

## 地球資源システム工学グローバルコース

Category 分類	Subject 授業科目	Credit(s) 単位	Term 割り当て時間										
			1st year				2nd year						
			Fall	Winter	Spring	Summer	Fall	Winter	Spring	Summer			
Advanced Subjects 高等専門科目	Resource Geology I (資源地質学第一)	2	4										
	Mineral Engineering, Experiments I (鉱物工学実験第一)	1										3	
	Mineral Engineering, Experiments II (鉱物工学実験第二)	1							3				
	Exploration Geophysics I (物理探査学第一)	2	4										
	Exploration Geophysics, Experiments I (物理探査学実験第一)	1				3							
	Exploration Geophysics, Experiments II (物理探査学実験第二)	1		3									
	Geothermics (Advanced) 地球熱学特論	2	4										
	Geothermal Engineering (Advanced), Experiments I (地熱工学特論実験第一)	1										3	
	Geothermal Engineering (Advanced), Experiments II (地熱工学特論実験第二)	1							3				
	Petroleum Resource Development Engineering (Advanced) I (石油資源開発工学特論第一)	2				4							
	Petroleum Resource Development Engineering (Advanced), Experiments I (石油資源開発工学特論実験第一)	1										3	
	Petroleum Resource Development Engineering (Advanced), Experiments II (石油資源開発工学特論実験第二)	1							3				
	Rock Engineering (Advanced) I (岩盤工学特論第一)	2				4							
	Rock Engineering (Advanced), Experiments I (岩盤工学特論実験第一)	1				3							
	Rock Engineering (Advanced), Experiments II (岩盤工学特論実験第二)	1		3									
	Mineral Processing, Recycling and Environmental Remediation Engineering (Advanced) I (資源処理・環境修復工学特論第一)	2	4										
	Mineral Processing, Recycling and Environmental Remediation Engineering (Advanced), Experiments I (資源処理・環境修復工学特論実験第一)	1				3							
	Mineral Processing, Recycling and Environmental Remediation Engineering (Advanced), Experiments II (資源処理・環境修復工学特論実験第二)	1		3									
	Energy Resources Engineering (Advanced) I (エネルギー資源工学特論第一)	2				4							
	Energy Resources Engineering (Advanced), Experiments I (エネルギー資源工学特論実験第一)	1				3							
Energy Resources Engineering (Advanced), Experiments II (エネルギー資源工学特論実験第二)	1		3										
Generalized Subjects 科目	Fundamentals of Earth Resources Engineering I (地球資源システム工学基礎第一)	2										2	
	Fundamentals of Earth Resources Engineering II (地球資源システム工学基礎第二)	2		2									
	International Project Management 国際プロジェクトマネジメント	2							2				

Advanced Spec 先端	Resource Geology II (資源地質学第二)	2		4						
	Mineral Engineering (鉱物工学)	2							2	
	Exploration Geophysics II (物理探査学第二)	2		4						
Advanced Specialized Subjects 先端科目	Exploration Geophysics III (物理探査学第三)	2							2	
	Geothermal Engineering (Advanced) (地熱工学特論)	2							2	
	Geothermal System Modeling (地熱系モデリング)	2		4						
	Petroleum Resource Development Engineering (Advanced) II (石油資源開発工学特論第二)	2	4							
	Environment and Safety (Advanced) (環境安全特論)	2							2	
	Rock Engineering (Advanced) II (岩盤工学特論第二)	2	4							
	Mining Machinery System Engineering (Advanced) (開発機械システム工学特論)	2							2	
	Mineral Processing, Recycling and Environmental Remediation Engineering (Advanced) II (資源処理・環境修復工学特論第二)	2		4						
	Mineral Processing, Recycling and Environmental Remediation Engineering (Advanced) III (資源処理・環境修復工学特論第三)	2							2	
	Energy Resources Engineering (Advanced) II (エネルギー資源工学特論第二)	2	4							
	Energy Resources Engineering (Advanced) III (エネルギー資源工学特論第三)	2							2	
	Special Lecture on Earth Resources Engineering I (地球資源システム工学特別講義第一)	1			1					
	Special Lecture on Earth Resources Engineering II (地球資源システム工学特別講義第二)	1	1							
	Special Lecture on Earth Resources Engineering III (地球資源システム工学特別講義第三)	1							1	
	Professional Skill Development 能力開発特別科目	Earth Resources Engineering, Seminar I (Research for Master Thesis) (地球資源システム工学演習第一)	2							2
Earth Resources Engineering, Seminar II (Research for Master Thesis) (地球資源システム工学演習第二)		2							2	
Earth Resources Engineering, Seminar III (Research for Master Thesis) (地球資源システム工学演習第三)		2							2	
International Cooperative Study on Earth System Engineering (Advanced) (地球工学国際連携特論)		2			2					
International Cooperative Study on Mining Engineering (Advanced) (資源システム工学国際連携特論)		2	2							
International Cooperative Study on Energy Resources Engineering (Advanced) (エネルギー資源工学国際連携特論)		2							2	
Research Planning on Earth Resources Engineering (地球資源システム工学研究企画)		2			2					
Earth Resources Engineering (Advanced) I (地球資源システム工学特論第一)		2						2		
Earth Resources Engineering (Advanced) II (地球資源システム工学特論第二)		2						2		

Earth Resources Engineering (Advanced) III (地球資源システム工学特論第三)	2					2		
Academic and Industrial Liaison Research on Earth Resources Engineering (地球資源システム工学産学連携研究)	2							(*)



# International Master's Program in Civil Engineering

土木工学グローバルコース

Category 分類	Subject 授業科目	Credit(s) 単位	Term 割り当て時間									
			1st year				2nd year					
			Fall	Winter	Spring	Summer	Fall	Winter	Spring	Summer		
Advanced Subjects 高等専門科目	Advanced Data Analysis (実践データ解析学)	2			4							
	Field Survey Method (野外調査法)	2			4							
	Research Planning (研究計画法)	2			4							
	Numerical Analysis (数値解析学)	2			4							
	Geo-Spatial Information Science (空間情報学)	2			4							
	Advanced Earthquake Engineering (地震工学特論)	2			2							
	Urban Engineering & Economics (都市工学・経済学)	2								4		
Advanced Specialized Subjects 先端科目	Advanced Structural Analysis (構造解析学特論)	2										2
	Technics of Seismic Isolation and Structural Control (免震制振工学)	2	2									
	Advanced Concrete Engineering (コンクリート工学特論)	2										2
	Advanced Steel Structure (鋼構造特論)	2	2									
	Mechanics of Geomaterials (地盤材料力学)	2			2							
	Advanced Foundation Design and Constructions (建設基礎対策学)	2						2				
	Risk Management in Natural Disaster Prevention (災害リスク学)	2										2
	Advanced Geotechnical Modeling and its Application (地盤解析学)	2	2									
	Geo-disaster Prevention and Mitigation (防災地盤学)	2	2									
	Advanced River Engineering (河川工学特論)	2				4						
	Environmental Hydraulics (環境水理学)	2						2				
	Advanced Ocean and Coastal Engineering (沿岸・海洋工学特論)	2	2									
	Urban Transport Planning (都市総合交通計画)	2			2							
	Practical Application of Aesthetic Design in Civil Engineering (実践景観デザイン論)	2										2
	Urban Development Project (社会基盤財政論)	2	2									
	Material Cycles and Waste Management (廃棄物資源循環学)	2						2				
	Environmental Planning (環境計画論)	2										2
	Biological Water Quality Control Engineering (水質変換工学)	2			2							
	Land development and disaster risk management in Japan (国土開発・災害リスクマネジメント)	2	2									
	Groundwater Environmental Systems (地下水環境システム論)	2										2
	Advanced Ecological Engineering (応用生態工学)	2						2				
	Geo-environmental System Engineering (地盤環境システム工学)	2			2							
Professional Skill Development 能力開発特別科目	Problem Solution Seminar B (課題解決セミナーB)	2		4								
	Presentation Exercise (プレゼンテーション演習)	2		4								
	Practice in Environmental Studies (環境学実習)	2			2							
	Civil Engineering Internship (産学連携研究)	2										
	Advanced Civil and Structural Engineering 1 (社会基盤工学特論第一)	2							4			
	Advanced Civil and Structural Engineering 2 (社会基盤工学特論第二)	2							4			
	Advanced Civil and Structural Engineering 3 (社会基盤工学特論第三)	2							4			
	Advanced Civil and Structural Engineering 4 (社会基盤工学特論第四)	2							4			
	Civil and Structural Engineering Seminar 1 (社会基盤工学演習第一)	2							8			
	Civil and Structural Engineering Seminar 2 (社会基盤工学演習第二)	2							8			
	Civil and Structural Engineering Seminar 3 (社会基盤工学演習第三)	2							8			
	Civil and Structural Engineering Seminar 4 (社会基盤工学演習第四)	2							8			

Professional Skill Development 能力開発特別科目	Advanced Urban Environmental Engineering 1 (都市環境工学特論第一)	2						4		
	Advanced Urban Environmental Engineering 2 (都市環境工学特論第二)	2						4		
	Advanced Urban Environmental Engineering 3 (都市環境工学特論第三)	2						4		
	Advanced Urban Environmental Engineering 4 (都市環境工学特論第四)	2						4		
	Advanced Urban Environmental Engineering 5 (都市環境工学特論第五)	2						4		
	Urban Environmental Engineering Seminar 1 (都市環境工学演習第一)	2						8		
	Urban Environmental Engineering Seminar 2 (都市環境工学演習第二)	2						8		
	Urban Environmental Engineering Seminar 3 (都市環境工学演習第三)	2						8		
	Urban Environmental Engineering Seminar 4 (都市環境工学演習第四)	2						8		
	Urban Environmental Engineering Seminar 5 (都市環境工学演習第五)	2						8		

# Cross-disciplinary Courses

## 関連科目

### Common Subjects for International Students

外国人留学生に共通の授業科目

Subject 授業科目	Credit(s) 単位	Term 割り当て時間							
		1st year				2nd year			
		Fall	Winter	Spring	Summer	Fall	Winter	Spring	Summer
Applied IT I (IT応用第一)	2			2					
Applied IT II (IT応用第二)	2	2							
Advanced Japanese Industries (日本産業特論)	2	2							
Engineering Analysis (工学解析特論)	2			2					
Basic Engineering Analysis and Measurement I (工学解析・計測特論Ⅰ)	1	2							
Basic Engineering Analysis and Measurement II (工学解析・計測特論Ⅱ)	1		2						
Survival Japanese I (サバイバル・ジャパニーズⅠ)	1	1		1					
Survival Japanese II (サバイバル・ジャパニーズⅡ)	1	1		1					
Japanese for Business Communication (日本語ビジネス・コミュニケーション)	1			2					
Active Japanese I (アクティブ日本語Ⅰ)	1			1				1	
Active Japanese II (アクティブ日本語Ⅱ)	1	1				1			
Progressive Japanese I (プログレッシブ日本語Ⅰ)	1			1				1	
Progressive Japanese II (プログレッシブ日本語Ⅱ)	1	1				1			

## Doctoral Programs (博士後期課程)

### International Doctoral Program in Materials

材料工学グローバルコース

Category 分類	Subject 授業科目	Credit(s) 単位
Required Specialized Subjects コース授業科目	Advanced Materials (A) (材料工学講究A)	4
	Advanced Materials (B) (材料工学講究B)	4
	Advanced Materials (C) (材料工学講究C)	4
	Advanced Materials (D) (材料工学講究D)	4
	Advanced Materials (E) (材料工学講究E)	4
	Advanced Materials (F) (材料工学講究F)	4
	Advanced Materials (G) (材料工学講究G)	4
	Advanced Materials (H) (材料工学講究H)	4
	Advanced Materials (I) (材料工学講究I)	4
	Advanced Materials (J) (材料工学講究J)	4
	Advanced Materials (K) (材料工学講究K)	4
	Advanced Materials (L) (材料工学講究L)	4
	Research Planning in Materials (材料工学研究企画演習)	4
	Teaching Practice on Materials (材料工学指導演習)	2
	Special Exercises in Materials (材料工学特別演習)	2
	Industry-Academia Joint Training in Materials (材料工学産学連携実習)	4
	Engineering Research Planning (工学研究企画)	2

# International Doctoral Program in Applied Chemistry

## 応用化学グローバルコース

Category 分類	Subject 授業科目	Credit(s) 単位	
Required Specialized Subjects コース授業科目	Research Subjects 講究科目	Functional Materials Chemistry, Advanced Topic A (機能物質化学講究A)	4
		Functional Materials Chemistry, Advanced Topic B (機能物質化学講究B)	4
		Functional Materials Chemistry, Advanced Topic C (機能物質化学講究C)	4
		Functional Materials Chemistry, Advanced Topic D (機能物質化学講究D)	4
		Functional Materials Chemistry, Advanced Topic E (機能物質化学講究E)	4
		Functional Materials Chemistry, Advanced Topic F (機能物質化学講究F)	4
		Functional Materials Chemistry, Advanced Topic G (機能物質化学講究G)	4
		Functional Materials Chemistry, Advanced Topic H (機能物質化学講究H)	4
		Functional Materials Chemistry, Advanced Topic I (機能物質化学講究I)	4
		Functional Materials Chemistry, Advanced Topic J (機能物質化学講究J)	4
		Functional Materials Chemistry, Advanced Topic K (機能物質化学講究K)	4
		Functional Materials Chemistry, Advanced Topic L (機能物質化学講究L)	4
		Molecular Life Science and Engineering, Advanced Topic A (分子生命工学講究A)	4
		Molecular Life Science and Engineering, Advanced Topic B (分子生命工学講究B)	4
		Molecular Life Science and Engineering, Advanced Topic C (分子生命工学講究C)	4
		Molecular Life Science and Engineering, Advanced Topic D (分子生命工学講究D)	4
		Molecular Life Science and Engineering, Advanced Topic E (分子生命工学講究E)	4
		Molecular Life Science and Engineering, Advanced Topic F (分子生命工学講究F)	4
		Molecular Life Science and Engineering, Advanced Topic G (分子生命工学講究G)	4
		Molecular Life Science and Engineering, Advanced Topic H (分子生命工学講究H)	4
		Molecular Life Science and Engineering, Advanced Topic I (分子生命工学講究I)	4
		Molecular Life Science and Engineering, Advanced Topic J (分子生命工学講究J)	4
		Molecular Life Science and Engineering, Advanced Topic K (分子生命工学講究K)	4
		Molecular Life Science and Engineering, Advanced Topic L (分子生命工学講究L)	4
	Research Planning Exercises in Applied Chemistry (応用化学研究企画演習)	2	
	Teaching Practice in Applied Chemistry (応用化学指導演習)	2	
	Special Exercises in Applied Chemistry (1) (応用化学特別演習第一)	2	
	Special Exercises in Applied Chemistry (2) (応用化学特別演習第二)	2	
	Industry-University Joint Training (1) (産学連携実習第一)	4	
	Industry-University Joint Training (2) (産学連携実習第二)	4	
	Industry-University Joint Training (3) (産学連携実習第三)	4	
	Engineering Research Planning (工学研究企画)	2	

# International Doctoral Program in Chemical Engineering

## 化学工学グローバルコース

Category 分類		Subject 授業科目	Credit(s) 単位
Required Specialized Subjects コース授業科目	Research Subjects 講究科目	Chemical Engineering Advenced Topic A (化学工学講究A)	4
		Chemical Engineering Advenced Topic B (化学工学講究B)	4
		Chemical Engineering Advenced Topic C (化学工学講究C)	4
		Chemical Engineering Advenced Topic D (化学工学講究D)	4
		Chemical Engineering Advenced Topic E (化学工学講究E)	4
		Chemical Engineering Advenced Topic F (化学工学講究F)	4
		Chemical Engineering Advenced Topic G (化学工学講究G)	4
		Chemical Engineering Advenced Topic H (化学工学講究H)	4
		Chemical Engineering Advenced Topic I (化学工学講究I)	4
		Research planning in Chemical Engineering (化学工学研究企画演習)	4
		Special Excersices in Chemical Engineering I (化学工学特別演習第一)	2
		Special Excersices in Chemical Engineering II (化学工学特別演習第二)	2
		Engineering Research Planning (工学研究企画)	2

# International Doctoral Program in Mechanical Engineering

## 機械工学 グローバルコース

Category 科目群	Subject 授業科目	Credit(s) 単位
Required Specialized Subjects コース授業科目	Advanced Material Strength (材料力学講究)	4
	Advanced Design Engineering (設計工学講究)	4
	Advanced Thermal Engineering (熱工学講究)	4
	Advanced Fluids Engineering (流体工学講究)	4
	Advanced Dynamics of Machinery (機械力学講究)	4
	Advanced Control Systems (制御システム講究)	4
	Advanced Manufacturing Process (加工プロセス講究)	4
	Advanced Biomechanical and Biothermal Engineering (生体工学講究)	4
	Seminar in Material Strength (材料力学セミナー)	2
	Seminar in Design Engineering (設計工学セミナー)	2
	Seminar in Thermal Engineering (熱工学セミナー)	2
	Seminar in Fluids Engineering (流体工学セミナー)	2
	Seminar in Dynamics of Machinery (機械力学セミナー)	2
	Seminar in Control Systems (制御システムセミナー)	2
	Seminar in Manufacturing Process (加工プロセスセミナー)	2
	Seminar in Biomechanical and Biothermal Engineering (生体工学セミナー)	2
	Mechanical Engineering Research Planning (機械工学研究企画演習)	2
	Internship (機械工学インターンシップ)	4
	International Internship (機械工学国際インターンシップ)	4
	Communication for Mechanical Engineers (機械工学コミュニケーション)	2
	Teaching Practice on Mechanical Engineering (機械工学指導演習)	1
	Engineering Research Planning (工学研究企画)	2

# International Doctoral Program in Hydrogen Energy Systems

## 水素エネルギーシステム グローバルコース

Category 科目群	Subject 授業科目	Credit(s) 単位	
Required Specialized Subjects コース授業科目	Research Subjects 講究科目	Tutorials on Hydrogen System A (水素システム講究A)	4
		Tutorials on Hydrogen System B (水素システム講究B)	4
		Tutorials on Hydrogen System C (水素システム講究C)	4
		Tutorials on Material and Design A (水素材料・設計学講究A)	4
		Tutorials on Material and Design B (水素材料・設計学講究B)	4
		Tutorials on Material and Design C (水素材料・設計学講究C)	4
		Tutorials on Material and Design D (水素材料・設計学講究D)	4
		Tutorials on Thermofluid Engineering (水素熱流体工学講究)	4
	Advanced Hydrogen Energy Engineering (水素エネルギー工学特論)	2	
	Advanced Energy Technologies (先端エネルギー技術論)	2	
	Seminar in Hydrogen System A (水素システムセミナーA)	2	
	Seminar in Hydrogen System B (水素システムセミナーB)	2	
	Seminar in Hydrogen System C (水素システムセミナーC)	2	
	Seminar in Material and Design A (水素材料・設計学セミナーA)	2	
	Seminar in Material and Design B (水素材料・設計学セミナーB)	2	
	Seminar in Material and Design C (水素材料・設計学セミナーC)	2	
	Seminar in Material and Design D (水素材料・設計学セミナーD)	2	
	Seminar in Thermofluid Engineering (水素熱流体工学セミナー)	2	
	Project Analysis (プロジェクト演習)	2	
	International Internship I (国際連携インターンシップ I)	2	
	International Internship II (国際連携インターンシップ II)	2	
	Internship (産学連携インターンシップ)	2	
	Research Planning (水素エネルギーシステム研究企画演習)	2	
	Training as Supervisor (水素エネルギーシステム指導演習)	2	
	Engineering Research Planning (工学研究企画)	2	



# International Doctoral Program in Aeronautics and Astronautics

## 航空宇宙工学グローバルコース

Category 科目群	Subject 授業科目	Credit(s) 単位
Required Specialized Subjects コアコース授業科目	Advanced Aerospace Propulsion (推進工学講究)	4
	Advanced Fluid Dynamics (流体力学講究)	4
	Advanced Thermophysical Engineering (熱物理学講究)	4
	Advanced Aerospace Structural Systems Engineering (軽構造システム工学講究)	4
	Advanced Materials for Aerospace (航空宇宙材料学講究)	4
	Advanced Guidance and Control (誘導制御講究)	4
	Advanced Flight Dynamics (飛行力学講究)	4
	Advanced Space Systems Engineering (宇宙システム工学講究)	4
	Advanced Space Transportation Systems Engineering (宇宙輸送システム工学講究)	4
	Advanced Orbital Systems Engineering (軌道上システム工学講究)	4
	Advanced Seminar in Aeronautics and Astronautics I (航空宇宙工学高等セミナー I)	2
	Advanced Seminar in Aeronautics and Astronautics II (航空宇宙工学高等セミナー II)	2
	Aerospace Engineering Research Planning (航空宇宙工学研究企画演習)	2
	Internship in Aerospace Engineering (航空宇宙工学インターンシップ)	2
	International Internship in Aerospace Engineering (航空宇宙工学国際インターンシップ)	2
	Communication for Aerospace Engineers I (航空宇宙工学コミュニケーションI)	1
	Communication for Aerospace Engineers II (航空宇宙工学コミュニケーションII)	1
	Aeronautics and Astronautics Project A (航空宇宙工学プロジェクトA)	2
	Aeronautics and Astronautics Project B (航空宇宙工学プロジェクトB)	2
	Teaching Practice on Aeronautics and Astronautics Engineering (航空宇宙工学指導演習)	2
Engineering Research Planning (工学研究企画)	2	

**International Doctoral Program  
in Applied Quantum Physics and Nuclear Engineering**  
量子物理工学グローバルコース

Category 科目群	Subject 授業科目	Credit(s) 単位
Required Specialized Subjects コース授業科目	Colloquium on Nuclear and Radiation Engineering A (原子核・量子線工学講究A)	4
	Colloquium on Nuclear and Radiation Engineering B (原子核・量子線工学講究B)	4
	Colloquium on Nuclear Energy Systems A (核エネルギーシステム学講究A)	4
	Colloquium on Nuclear Energy Systems B (核エネルギーシステム学講究B)	4
	Colloquium on Nuclear Energy Systems C (核エネルギーシステム学講究C)	4
	Colloquium on Materials Science for Energy Systems A (エネルギー物質科学講究A)	4
	Colloquium on Materials Science for Energy Systems B (エネルギー物質科学講究B)	4
	Colloquium on Materials Science for Energy Systems C (エネルギー物質科学講究C)	4
	Colloquium on Applied Physics A (応用物理学講究A)	4
	Colloquium on Applied Physics B (応用物理学講究B)	4
	Colloquium on Applied Physics C (応用物理学講究C)	4
	Research Study in Industrial Fields (産学連携実習)	4
	Research Planning on Applied Quantum Physics and Nuclear Engineering (エネルギー量子工学研究企画演習)	2
	Teaching Practice in Applied Quantum Physics and Nuclear Engineering (エネルギー量子工学指導演習)	2
	Advanced Topics of Applied Quantum Physics and Nuclear Engineering (エネルギー量子工学特論)	2
	Engineering Research Planning (工学研究企画)	2

## International Doctoral Program in Naval Architecture and Ocean Engineering

### 船舶海洋工学グローバルコース

Category 科目群	Subject 授業科目	Credit(s) 単位	
Required Specialized Subjects コース授業科目	Research Subjects 講究科目	Investigation of Performance of Ships and Marine Structures A (船舶海洋性能工学講究A)	4
		Investigation of Performance of Ships and Marine Structures B (船舶海洋性能工学講究B)	4
		Investigation of Performance of Ships and Marine Structures C (船舶海洋性能工学講究C)	4
		Investigation of Structural Engineering on Marine Structures A (船舶海洋構造工学講究A)	4
		Investigation of Structural Engineering on Marine Structures B (船舶海洋構造工学講究B)	4
		Investigation of Structural Engineering on Marine Structures C (船舶海洋構造工学講究C)	4
		Investigation of Design of Marine Systems A (海洋システム設計学講究A)	4
		Investigation of Design of Marine Systems B (海洋システム設計学講究B)	4
		Investigation of Design of Marine Systems C (海洋システム設計学講究C)	4
	Required Specialized Subjects コース授業科目	Individual Work on Research Planning on Earth Resources, Marine and Civil Engineering (地球環境工学研究企画演習)	4
		Supervised Seminar on Earth Resources, Marine and Civil Engineering (地球環境工学指導演習)	2
		Special Seminar on Earth Resources, Marine and Civil Engineering (地球環境工学特別演習)	2
		Academic and Industrial Liaison Seminar (産学連携実習)	4
		Engineering Research Planning (工学研究企画)	2

## International Doctoral Program in Earth Resources Engineering

### 地球資源システム工学グローバルコース

Category 科目群	Subject 授業科目	Credit(s) 単位	
Required Specialized Subjects コース授業科目	Research Subjects 講究科目	Earth System Science (地球システム科学)	4
	Research Subjects 講究科目	Environmental Geophysics (地球情報工学)	4
	Research Subjects 講究科目	Geothermal Science and Engineering (地球熱システム学)	4
	Research Subjects 講究科目	Mining Technology (資源開発システム工学)	4
	Research Subjects 講究科目	Mine Design and Geo-Development Engineering (鉱山設計・地圏開発工学)	4
	Research Subjects 講究科目	Resources Processing and Environmental Remediation System Engineering (資源処理・環境修復システム工学)	4
	Research Subjects 講究科目	Energy Resources Engineering (エネルギー資源工学)	4
	Research Subjects 講究科目	Individual Work on Research Planning on Earth Resources Engineering (地球資源システム工学研究企画演習)	2
	Research Subjects 講究科目	Supervised Seminar on Earth Resources Engineering (地球資源システム工学指導演習)	2
	Research Subjects 講究科目	Special Seminar on Earth Resources Engineering (地球資源システム工学特別演習)	2
	Research Subjects 講究科目	Academic and Industrial Liaison Seminar (産学連携演習)	4
	Research Subjects 講究科目	Engineering Research Planning (工学研究企画)	2

# International Doctoral Program in Civil Engineering

## 土木工学グローバルコース

Category 分類	Subject 授業科目	Credit(s) 単位	
Required Specialized Subjects コース授業科目	Advanced Civil Engineering Materials A (建設材料工学講究A)	4	
	Advanced Civil Engineering Materials B (建設材料工学講究B)	4	
	Advanced Civil Engineering Design A (建設設計工学講究A)	4	
	Advanced Civil Engineering Design B (建設設計工学講究B)	4	
	Advanced Geotechnical Disaster Prevention A (防災地盤工学講究A)	4	
	Advanced Geotechnical Disaster Prevention B (防災地盤工学講究B)	4	
	Advanced Environmental Geotechnology (環境地盤工学講究)	4	
	Advanced City Planning A (都市システム計画学講究A)	4	
	Advanced City Planning B (都市システム計画学講究B)	4	
	Advanced Environmental Design A (環境デザイン工学講究A)	4	
	Advanced Urban Environmental Engineering A (都市環境工学講究A)	4	
	Advanced Urban Environmental Engineering B (都市環境工学講究B)	4	
	Advanced Environmental System Engineering A (環境システム工学講究A)	4	
	Advanced Environmental Hydraulics (環境水理学講究)	4	
	Advanced Coastal Engineering (沿岸海洋工学講究)	4	
	Research Subjects 講究科目	Research Planning on Civil Engineering (土木工学研究企画演習)	4
	Teaching Practice on Civil Engineering (土木工学指導演習)	2	
	Special Practice on Civil Engineering (土木工学特別演習)	2	
	Advanced Civil Engineering Internship (産学連携実習)	4	
	Engineering Research Planning (工学研究企画)	2	