Appendix 1. (Ref. Article 2)
Graduate School of Life Science and Systems Engineering Graduate Program Curriculum Tables

# Subjects shared by both the Department of Biological Functions Engineering and the Department of Human Intelligence Systems

＜**Shared Subjects**＞

| Subject Title | Credit Category | Credit | Grade |
|---|---|---|---|
| Life Science and Systems Engineering Seminar Series | Elective | 2 | 1・2 |
| Introduction to Green Innovation | Elective | 2 | 1・2 |
| Introduction to Life Innovation | Elective | 2 | 1・2 |
| Introduction to Human Intelligence Systems | Elective | 2 | 1・2 |
| GE$^3$ Seminar | Elective | 2 | 1・2 |
| Advanced Environmental Studies | Elective | 1 | 1・2 |
| Advanced Lectures on the SDGs | Elective | 1 | 1・2 |
| Advanced Motor Neurophysiology | Elective | 1 | 1・2 |
| Advanced Course in Instructional Design | Elective | 1 | 1・2 |
| Introduction to Entrepreneurship | Elective | 1 | 1・2 |
| Entrepreneurship with Exercises | Elective | 1 | 1・2 |
| Introduction to Design Thinking | Elective | 1 | 1・2 |
| Introduction to Business Planning | Elective | 1 | 1・2 |
| Advanced Course for New Technology Development | Elective | 1 | 1・2 |
| Advanced Course for Venture Business | Elective | 1 | 1・2 |

＜**Practical Subjects**＞

| Subject Title | Credit Category | Credit | Grade |
|---|---|---|---|
| English Ⅶ C（Note 1） | Elective | 1 | 1・2 |
| English Ⅷ B（Note 1） | Elective | 1 | 1・2 |
| English Ⅸ B（Note 1） | Elective | 1 | 1・2 |
| English Ⅸ D（Note 1） | Elective | 1 | 1・2 |
| English Ⅹ A（Note 1） | Elective | 1 | 1・2 |
| English Ⅹ D（Note 1） | Elective | 1 | 1・2 |
| Elective English 2T | Elective | 1 | 1・2 |
| Elective English 4T | Elective | 1 | 1・2 |
| Introductory Japanese Ⅰ（Note 2） | Elective | 1 | 1・2 |
| Introductory Japanese Ⅱ（Note 2） | Elective | 1 | 1・2 |
| Domestic Internship1 (Note 3) | Elective | 1 | 1・2 |
| Domestic Internship2 (Note 3) | Elective | 2 | 1・2 |
| Advanced Overseas Study Ⅰ（Note 4,6） | Elective | 1 | 1・2 |
| Advanced Overseas Study Ⅱ（Note 4,6） | Elective | 2 | 1・2 |
| Advanced Overseas Internship Ⅰ（Note 5,6） | Elective | 1 | 1・2 |
| Advanced Overseas Internship Ⅱ（Note 5,6） | Elective | 2 | 1・2 |
| Advanced International Collaborative Learning | Elective | 1 | 1・2 |
| Exercises on Advanced Robotics Integration I | Elective | 1 | 1・2 |
| Exercises on Advanced Robotics Integration II | Elective | 1 | 1・2 |
| Exercises on Advanced Robotics Integration III | Elective | 1 | 2 |
| Exercises on Team Management | Elective | 1 | 1・2 |

▽The following subjects are only available to students in the Department of Human Intelligence Systems.

| Subject Title | Credit Category | Credit | Grade |
|---|---|---|---|
| DEGEIKO program 1 | Elective | 1 | 1・2 |
| DEGEIKO program 2 | Elective | 1 | 1・2 |

Note 1. English classes
*The Roman numerals (VII-X) attached to the names of English classes indicate level of difficulty, the letters (A-D) indicate the target skill, as shown below.

    A: Writing   B: Reading   C: Comprehensive   D: Speaking

*Students may not take subjects that are lower in level than subjects for which they have already earned credits, including those taken in an undergraduate school.
*Please note that information on which subjects to take first will be posted in the graduate school concerned.
*Students who wish to take subjects on another campus must obtain approval by applying in advance to the Academic Section of the school to which they belong.
Note 2. Introductory Japanese I and II are for international students only.
Note 3. It is not possible to take both Domestic Internship 1 and Domestic Internship 2.
Note 4. It is not possible to take both Graduate School Study Abroad I and Graduate School Study Abroad II.
Note 5. It is not possible to acquire both Graduate School Overseas Internship Practicum I and Graduate School Overseas Internship Practicum II.
Note 6. Credit conferral will only be approved for Graduate School Study Abroad Program I, Graduate School Study Abroad Program II, Graduate School Overseas Internship Practicum I and Graduate School Overseas Internship Practicum II if the credits are conferred prior to assessment of completion.

# Department of Biological Functions Engineering
## ＜Specialized Subjects＞

| Subject Title | Credit Category | Credit | Grade |
|---|---|---|---|
| Semiconductor Power Devices | Elective | 2 | 1・2 |
| Advanced Electrochemical Technology | Elective | 2 | 1・2 |
| Nano materias and energy conversion | Elective | 2 | 1・2 |
| Applied power electronics | Elective | 2 | 1・2 |
| Organic Electronic Materials and Devices | Elective | 2 | 1・2 |
| Micro total analysis systems | Elective | 2 | 1・2 |
| Bio-MEMS | Elective | 2 | 1・2 |
| Biofluid Engineering | Elective | 2 | 1・2 |
| Biomechanical dynamics | Elective | 2 | 1・2 |
| Biomechanics | Elective | 2 | 1・2 |
| Functional Biomaterials | Elective | 2 | 1・2 |
| Harmonic Functional Materials Chemistry | Elective | 2 | 1・2 |
| Clean Cycle Chemistry based on Microbial Functions | Elective | 2 | 1・2 |
| Clean Cycle Chemistry based on Functional Interface Engineering | Elective | 2 | 1・2 |
| Biopolymers Structure and Functions | Elective | 2 | 1・2 |
| Biofunctional molecular engineering | Elective | 2 | 1・2 |
| Clean Cycle Chemistry based on Photo-functional Materials | Elective | 2 | 1・2 |
| Mechatronics | Elective | 2 | 1・2 |
| Micro-Technology | Elective | 2 | 1・2 |

| Subject Title | Credit Category | Credit | Grade |
|---|---|---|---|
| Semiconductor Materials and Devices | Elective | 2 | 1・2 |
| Collaborative Brainstorming on Clean Cycle Chemistry | Elective | 2 | 1・2 |
| Environmental Benign Material Chemistry | Elective | 2 | 1・2 |
| Clean Cycle Chemistry based on Catalyst Electrolytic | Elective | 2 | 1・2 |
| Exercises on Computational Biomechanics | Elective | 1 | 1・2 |
| Exercises on Measurement Control Systems | Elective | 1 | 1・2 |
| Bioinfomatics | Elective | 1 | 1・2 |
| Interdisciplinary training 1 | Elective | 1 | 1・2 |
| Interdisciplinary training 2 | Elective | 1 | 1・2 |
| Intelligent information processing for automobiles | Elective | 2 | 1・2 |
| Introduction to AI and Robotics | Elective | 2 | 1・2 |
| Seminar on semiconductor topics | Elective | 2 | 1・2 |
| Comprehensive subject1 | Elective | 1 | 1・2 |
| Comprehensive subject2 | Elective | 1 | 1・2 |
| Comprehensive subject3 | Elective | 2 | 1・2 |
| Comprehensive subject4 | Elective | 2 | 1・2 |

＜**Seminars**＞

| Subject Title | Credit Category | Credit | Grade |
|---|---|---|---|
| Biological Functions and Engineering Research | Compulsory | 2 | 1～2 |
| Biological Functions and Engineering Special Laboratory | Compulsory | 6 | 1～2 |

# Department of Human Intelligence Systems

＜**Specialized Subjects**＞

| Subject Title | Credit Category | Credit | Grade |
|---|---|---|---|
| Interactive Seminar | Compulsory | 2 | 1・2 |
| Robot Dynamics | Elective | 2 | 1・2 |
| Robot Learning Control | Elective | 1 | 1・2 |
| Biomimetics | Elective | 2 | 1・2 |
| Human Function Substitution System | Elective | 1 | 1・2 |
| Intelligent Integrated Systems | Elective | 1 | 1・2 |
| Intelligent Material Systems | Elective | 1 | 1・2 |
| Intelligent Digital Integrated Circuits | Elective | 1 | 1・2 |
| Practicum in Intelligent Machine Design | Elective | 1 | 1・2 |
| Introduction to Computer Systems | Elective | 1 | 1・2 |
| Basic Engineering (Introduction to Electric Circuits and Mechanics) | Elective | 1 | 1・2 |
| Robot Sensing | Elective | 2 | 1・2 |
| Machine Learning 1A | Elective | 1 | 1・2 |
| Machine Learning 1B | Elective | 1 | 1・2 |
| Fandamental Machine Learning 2A | Elective | 1 | 1・2 |
| Fandamental Machine Learning 2B | Elective | 1 | 1・2 |
| Brain-Inspired Learning Theory A | Elective | 1 | 1・2 |

| | | | |
|---|---|---|---|
| Brain-Inspired Learning Theory B | Elective | 1 | 1・2 |
| Brain-Inspired Information Processing A | Elective | 1 | 1・2 |
| Brain-Inspired Information Processing B | Elective | 1 | 1・2 |
| Brain Inspired Artificial Intelligence | Elective | 2 | 1・2 |
| Fundamentals of Mathematics A | Elective | 2 | 1・2 |
| Fundamentals of Mathematics B | Elective | 2 | 1・2 |
| Information Processing using Brain Dynamical System | Elective | 2 | 1・2 |
| Mathematical Neurophysiology A | Elective | 1 | 1・2 |
| Mathematical Neurophysiology B | Elective | 1 | 1・2 |
| Molecular Sensing Systems | Elective | 2 | 1・2 |
| Team Management | Elective | 2 | 1・2 |
| Practicum in Neural Information Processing | Elective | 2 | 1・2 |
| Basic Neuroscience | Elective | 2 | 1・2 |
| Behavioral cognitive psychology | Elective | 2 | 1・2 |
| Laboratory Animal Science | Elective | 2 | 1・2 |
| Visuomotor Control System | Elective | 2 | 1・2 |
| Psychophysiology | Elective | 2 | 1・2 |
| Large-scale neural network simulation | Elective | 2 | 1・2 |
| Brain dynamics and Neural Information Processing | Elective | 2 | 1・2 |
| Measurement of Human Brain Function | Elective | 2 | 1・2 |
| Vision Sensing and Systems Intelligence Engineering | Elective | 2 | 1・2 |
| Neuronal mechanism for human sensory transduction | Elective | 2 | 1・2 |
| Intelligent information processing for automobiles | Elective | 2 | 1・2 |
| Introduction to AI and Robotics | Elective | 2 | 1・2 |
| Seminar on semiconductor topics | Elective | 2 | 1・2 |
| AI Seminar | Elective | 2 | 1・2 |
| AAR Seminar | Elective | 1 | 1・2 |
| Practicum in Robot Operating System | Elective | 1 | 1・2 |
| Practicum in Care and Medical DX | Elective | 1 | 1・2 |
| Interdisciplinary training 1 | Elective | 1 | 1・2 |
| Interdisciplinary training 2 | Elective | 1 | 1・2 |
| Comprehensive subject1 | Elective | 1 | 1・2 |
| Comprehensive subject2 | Elective | 1 | 1・2 |
| Comprehensive subject3 | Elective | 2 | 1・2 |
| Comprehensive subject4 | Elective | 2 | 1・2 |
| Advanced Human Intelligence Systems 1 | Elective | 1 | 1・2 |
| Advanced Human Intelligence Systems 2 | Elective | 1 | 1・2 |
| Advanced Human Intelligence Systems 3 | Elective | 1 | 1・2 |
| Advanced Human Intelligence Systems 4 | Elective | 1 | 1・2 |

<＜Seminars＞

| Subject Title | Credit Category | Credit | Grade |
|---|---|---|---|
| Human Intelligence Systems　Research | Compulsory | 2 | 1〜2 |
| Human Intelligence Systems Special Laboratory | Compulsory | 6 | 1〜2 |

# Department of Life Science and Systems Engineering

＜**Practical Subjects**＞

| Subject Title | Credit Category | Credit | Grade |
|---|---|---|---|
| Domestic Extra-Mural Studies 1 | Elective | 1 | 1・2・3 |
| Domestic Extra-Mural Studies 2 | Elective | 1 | 1・2・3 |
| International Extra-Mural Studies 1 | Elective | 1 | 1・2・3 |
| International Extra-Mural Studies 2 | Elective | 1 | 1・2・3 |
| Research Workshop 1 | Elective | 2 | 1・2・3 |
| Research Workshop 2 | Elective | 2 | 1・2・3 |
| DEGEIKO program 1 | Elective | 1 | 1・2・3 |
| DEGEIKO program 2 | Elective | 1 | 1・2・3 |
| DEGEIKO program 3 | Elective | 1 | 1・2・3 |
| DEGEIKO program 4 | Elective | 1 | 1・2・3 |
| English Technical Writing | Elective | 1 | 1・2・3 |
| Introductory Japanese Ⅰ（Note 1) | Elective | 1 | 1・2・3 |
| Introductory Japanese Ⅱ（Note 1) | Elective | 1 | 1・2・3 |
| Exercises on Advanced Robotics Integration I | Elective | 1 | 1・2・3 |
| Exercises on Advanced Robotics Integration II | Elective | 1 | 1・2・3 |
| Exercises on Advanced Robotics Integration III | Elective | 1 | 1・2・3 |
| Exercises on Team Management | Elective | 1 | 1・2・3 |

Note 1. Introductory Japanese I and II are for international students only.

＜**Specialized Subjects**＞

| Subject Title | Credit Category | Credit | Grade |
|---|---|---|---|
| Life Science and Systems Engineering Seminar Series | Elective | 2 | 1・2・3 |
| GE$^3$ Seminar | Elective | 2 | 1・2・3 |
| Semiconductor Power Devices | Elective | 2 | 1・2・3 |
| Advanced Electrochemical Technology | Elective | 2 | 1・2・3 |
| Nano materias and energy conversion | Elective | 2 | 1・2・3 |
| Applied power electronics | Elective | 2 | 1・2・3 |
| Organic Electronic Materials and Devices | Elective | 2 | 1・2・3 |
| Micro total analysis systems | Elective | 2 | 1・2・3 |
| Bio-MEMS | Elective | 2 | 1・2・3 |
| Biofluid Engineering | Elective | 2 | 1・2・3 |
| Biomechanical dynamics | Elective | 2 | 1・2・3 |
| Biomechanics | Elective | 2 | 1・2・3 |
| Functional Biomaterials | Elective | 2 | 1・2・3 |
| Harmonic Functional Materials Chemistry | Elective | 2 | 1・2・3 |

| Clean Cycle Chemistry based on Microbial Functions | Elective | 2 | 1・2・3 |
|---|---|---|---|
| Clean Cycle Chemistry based on Functional Interface Engineering | Elective | 2 | 1・2・3 |
| Biopolymers  Structure and Functions | Elective | 2 | 1・2・3 |
| Biofunctional molecular engineering | Elective | 2 | 1・2・3 |
| Clean Cycle Chemistry based on Photo-functional Materials | Elective | 2 | 1・2・3 |
| Mechatronics | Elective | 2 | 1・2・3 |
| Micro-Technology | Elective | 2 | 1・2・3 |
| Semiconductor Materials and Devices | Elective | 2 | 1・2・3 |
| Collaborative Brainstorming on Clean Cycle Chemistry | Elective | 2 | 1・2・3 |
| Environmental Benign Material Chemistry | Elective | 2 | 1・2・3 |
| Clean Cycle Chemistry based on Catalyst Electrolytic | Elective | 2 | 1・2・3 |
| Interdisciplinary training 1 | Elective | 1 | 1・2・3 |
| Interdisciplinary training 2 | Elective | 1 | 1・2・3 |
| Robot Dynamics | Elective | 2 | 1・2・3 |
| Robot Learning Control | Elective | 1 | 1・2・3 |
| Biomimetics | Elective | 2 | 1・2・3 |
| Human Function Substitution System | Elective | 1 | 1・2・3 |
| Intelligent Integrated Systems | Elective | 1 | 1・2・3 |
| Intelligent Material Systems | Elective | 1 | 1・2・3 |
| Intelligent Digital Integrated Circuits | Elective | 1 | 1・2・3 |
| Introduction to Computer Systems | Elective | 1 | 1・2・3 |
| Basic Engineering (Introduction to Electric Circuits and Mechanics) | Elective | 1 | 1・2・3 |
| Robot Sensing | Elective | 2 | 1・2・3 |
| Machine Learning 1A | Elective | 1 | 1・2・3 |
| Machine Learning 1B | Elective | 1 | 1・2・3 |
| Fandamental Machine Learning 2A | Elective | 1 | 1・2・3 |
| Fandamental Machine Learning 2B | Elective | 1 | 1・2・3 |
| Brain-Inspired Learning Theory A | Elective | 1 | 1・2・3 |
| Brain-Inspired Learning Theory B | Elective | 1 | 1・2・3 |
| Brain-Inspired Information Processing A | Elective | 1 | 1・2・3 |
| Brain-Inspired Information Processing B | Elective | 1 | 1・2・3 |
| Brain Inspired Artificial Intelligence | Elective | 2 | 1・2・3 |
| Information Processing using Brain Dynamical System | Elective | 2 | 1・2・3 |
| Mathematical Neurophysiology A | Elective | 1 | 1・2・3 |
| Mathematical Neurophysiology B | Elective | 1 | 1・2・3 |
| Molecular Sensing Systems | Elective | 2 | 1・2・3 |
| Team Management | Elective | 2 | 1・2・3 |
| Basic Neuroscience | Elective | 2 | 1・2・3 |
| Behavioral cognitive psychology | Elective | 2 | 1・2・3 |
| Laboratory Animal Science | Elective | 2 | 1・2・3 |
| Visuomotor Control System | Elective | 2 | 1・2・3 |
| Psychophysiology | Elective | 2 | 1・2・3 |

| | | | |
|---|---|---|---|
| Large-scale neural network simulation | Elective | 2 | 1・2・3 |
| Brain dynamics and Neural Information Processing | Elective | 2 | 1・2・3 |
| Measurement of Human Brain Function | Elective | 2 | 1・2・3 |
| Vision Sensing and Systems Intelligence Engineering | Elective | 2 | 1・2・3 |
| Neuronal mechanism for human sensory transduction | Elective | 2 | 1・2・3 |
| Intelligent information processing for automobiles | Elective | 2 | 1・2・3 |
| Introduction to AI and Robotics | Elective | 2 | 1・2・3 |
| Seminar on semiconductor topics | Elective | 2 | 1・2・3 |
| AI Seminar | Elective | 2 | 1・2・3 |
| AAR Seminar | Elective | 1 | 1・2・3 |
| Practicum in Robot Operating System | Elective | 1 | 1・2・3 |
| Practicum in Care and Medical DX | Elective | 1 | 1・2・3 |
| Comprehensive subject1 | Elective | 1 | 1・2・3 |
| Comprehensive subject2 | Elective | 1 | 1・2・3 |
| Comprehensive subject3 | Elective | 2 | 1・2・3 |
| Comprehensive subject4 | Elective | 2 | 1・2・3 |
| Advanced Human Intelligence Systems 1 | Elective | 1 | 1・2・3 |
| Advanced Human Intelligence Systems 2 | Elective | 1 | 1・2・3 |
| Advanced Human Intelligence Systems 3 | Elective | 1 | 1・2・3 |
| Advanced Human Intelligence Systems 4 | Elective | 1 | 1・2・3 |

＜**Seminars**＞

| Subject Title | Credit Category | Credit | Grade |
|---|---|---|---|
| Biological Functions and Engineering Special Research | Compulsory | 6 | 1～3 |

Appendix 2. (Ref. Article 3) Department of Biological Functions Engineering

| Class Subject | | Registration Criteria |
|---|---|---|
| Shared Subjects | | 4 or more credits |
| Practical Subjects | | 3 or more credits |
| Specialized Subjects | | 13 or more credits |
| Seminars | Supervised Research | 2 credits |
| | Special Laboratory Work | 6 credits |
| Credits required for completion | | 30 or more credits |

Appendix 2. (Ref. Article 3) Department of Human Intelligence Systems

| Class Subject | | Registration Criteria |
|---|---|---|
| Shared Subjects | | 4 or more credits |
| Practical Subjects | | 3 or more credits |
| Specialized Subjects | | 13 or more credits<br>Students must take "Interactive Seminar" |
| Seminars | Supervised Research | 2 credits |
| | Special Laboratory Work | 6 credits |
| Credits required for completion | | 30 or more credits |

Appendix 2. (Ref. Article 3) Department of Life Science and Systems Engineering

| Class Subject | Registration Criteria |
|---|---|
| Practical Subjects and Specialized Subjects | Students must take at least 6 credits worth of practical subjects and specialized subjects |
| Special Seminars | 6 credits |
| Credits required for completion | 12 or more credits |