

平成30年度入学生対象

別記様式 1

主専攻プログラム詳述書

開設学部（学科）名〔生物生産学部（生物生産学科）〕

プログラムの名称（和文）	水産生物科学主専攻プログラム
（英文）	Fisheries Biology Program

1. 取得できる学位 学士（農学）

2. 概要

生物生産学部の5つの主専攻プログラム（生物圏環境学、水産生物科学、動物生産科学、食品科学および分子細胞機能学）では、生物生産に係わる自然科学から社会科学に及ぶ幅広い知識と知恵を身につけさせることを目標とする。具体的には、①生物資源と食料生産、バイオテクノロジー、生物環境の保全に関する基礎的知識の修得、②フィールド科学分野の体験学修、③生命倫理や技術者倫理の理解、④英語等の語学能力や情報処理能力の修得を目指した教育を行う。

水産生物科学主専攻プログラムは、水産生物科学コースの7つの教育科目（水圏資源生物学、水族生理学、水産増殖学、水族生態学、水族病理学、水族生化学、竹原ステーション：水産実験所）に所属する教員により実施され、履修する学生は、水産生物を含む魚類、水生無脊椎動物、海藻・海草類の生理、病理、生化学、分子、生態、行動、資源についての基本的知識と研究手法、水産生物の増養殖の技術と、これらを取りまく諸問題についての基本的知識、およびこれらの分野の国際的な課題と進歩を見渡すことのできる広い視野を身につける。また、海洋生物資源の生産や研究の現場で遭遇する諸問題の解決策を、自ら調べ計画立案実行し、収集した資料を解析して取りまとめ、文書および口頭で発表・討論できる力を養う。

本プログラムを修了した学生は、大学院への進学や農林水産関係の官公庁、食品・化学・医薬等に関係する業界で、国際的視野を持った研究者・専門技術者となることを期待する。

3. ディプロマ・ポリシー（学位授与の方針・プログラムの到達目標）

水産生物科学主専攻プログラムでは、水圏における食料生産や資源の循環・有効利用を目指す企業や法人機関等における専門技術者等として活躍できる人材を養成する。そのため本プログラムでは、以下の能力を身につけ、基準となる単位を修得すると共に規定の到達目標に達し、かつ生物生産学部が定める審査に合格した学生に「学士（農学）」の称号を授与します。

教養教育を通して

1. 自主的・自立的に学修する態度を習慣づけており、情報収集力・分析力・批判力を身につけ、これらを活用できる。

2. ものごとの本質と背景を広い視野から洞察する力や、国際人として生きるにふさわしい語学力と平和に関する関心を持っている。

3. 幅広い知識から、問題を発見し、真に問題解決に役立つ「知識体系」へと統合し、総合的な見地からものごとを俯瞰できる。

4. 一般的な科学的基礎知識を持ち、生物生産学の専門領域への応用展開に必要な知識と技能を理解できる。

専門教育（専門基礎科目）を通して

5. 生物及び生物圏に関する先端的な話題や基本的な概念を理解できる。

6. 生物生産学の価値志向性やグローバル化した社会との関わりを理解でき、科学の応用における対話や合意形成の重要性を理解できる。

7. 研究上の不正行為の問題性と研究者・技術者倫理の重要性を理解できる。

本プログラムの専門教育を通して

8. 水産生物、水産業、水圏環境に関する知識を習得し、水産資源の管理と水産物の利用の方法について理解できる。

9. 水産業と水圏環境の保全を両立させるために必要な理論を理解し、水産生物の諸特性について、生理学、生化学、分子生物学的手法を用いて分析・評価することができる。

10. 水産生物の取り扱いをその特性に基づいて実施でき、有用水産資源の管理・利用について技術者・研究者倫理に基づき、多面的視野にたって実践的に応用・活用できる。

11. 水産生物の具体的諸事象について、自分の考えをまとめ、文章や口頭で論理的に発表し、意見交換することができる。

4. カリキュラム・ポリシー（教育課程編成・実施の方針）

For entrants in AY 2018

Appended Form 1

Specifications for Major Program

Name of School (Program) [School of Applied Biological Science comprises]

Program name (Japanese)	水産生物科学主専攻プログラム
(English)	Fisheries Biology Program

1. Degree to be obtained: Bachelor of Agriculture

2. Overview

In the five major programs of the School of Applied Biological Science (Integrated Ecoscience Program, Fisheries Biology Program, Animal Science Program, Food Science Program, and Applied Molecular and Cellular Biology Program), the aim is to enable students to acquire a wide range of knowledge and wisdom in the realms of natural and social sciences related to applied biology. Specifically, we provide education that allows students to ① acquire basic knowledge regarding biotic resources and food production, biotechnology, and protection of the biological environment; ② gain experience in field science; ③ understand bioethics and engineering ethics; and ④ obtain capabilities in foreign languages such as English and in data processing.

In the Fisheries Biology Program, education is provided by faculty members belonging to seven educational subjects (biology of aquatic resources, fish neurobiology, aquaculture, benthos ecology, aquatic pathology, aquatic biochemistry, and the Takehara Marine Science Station) enabling students to acquire basic knowledge and skills related to physiology; pathology; biochemistry; molecules; ecology; ethology; the use of fish, aquatic invertebrates, and seaweed as resources; and techniques for the cultivation of aquatic organisms. Students are also given the education necessary to obtain basic knowledge regarding the problems related to the subjects mentioned above, as well as a broad perspective on the international challenges in these areas. In addition, they are taught to develop the ability to independently plan and execute studies in order to find solutions to the problems that they encounter in the field of the production and study of aquatic biological resources, to analyze and organize the materials they collect, and to publish and discuss their results orally and in writing.

The students educated in the program are expected to go on to graduate school, or to become researchers and specialists with an international outlook working in institutions such as the public office for agriculture and fisheries, or in business fields related to foods and chemical/pharmaceutical products.

3. Diploma policy (policy for awarding degrees and goal of the program)

The Fisheries Biology Program aims to develop professionals who are capable of working as specialists in a company or corporation that is engaged in such activities as food production, recycling, or the effective use of resources in the hydrosphere. As such, in this program, the degree of bachelor of agriculture will be awarded to students who have earned the required credits and certification to satisfy the specified level of achievement, passed the examination that is administered by the School of Applied Biological Science, and acquired the following abilities.

Through the liberal arts education, the student is required to acquire:

1. The ability to study independently, collecting, analyzing, and criticizing data, together with the willingness to demonstrate of the use of this ability;

2. Insight from a broad perspective into the essentials and background of phenomena, and the linguistic ability and interest in peace that are required for a citizen of the world;

3. The ability to identify a problem based on broad knowledge, to integrate findings to establish a "knowledge system" that is truly useful for problem solving, and to examine phenomena from a comprehensive perspective; and

4. General and basic knowledge of science that enables the student to develop the knowledge and skills required for application in any of the specialized fields of applied biological science.

Through the specialized education (specialized basic subjects), the student is required to acquire:

5. The ability to understand advanced topics and basic ideas related to organisms and the biosphere;

6. The ability to understand the value, orientation, and relevance to the globalized society of applied biology, and the importance of communication and consensus building related to the application of scientific results; and

7. An understanding of the problems regarding research misconduct, and the importance of research and engineering

<p>水産生物科学主専攻プログラムでは、プログラムが掲げる到達目標を学生に実現させるために、次の方針に従って教育課程を編成し、実践する。</p> <p>1. 教養教育では、平和を希求し、幅広く深い教養と総合的な判断力を培い、豊かな人間性を涵養することを目指し、さらに実用的外国語運用能力、国際的視野や異文化理解能力、情報活用能力やコミュニケーション能力を養成する。また、教養教育の中に基盤科目を配置し、生物生産学の専門領域への応用展開に必要な科学的な基礎知識と技能を理解する能力を養成する。</p> <p>2. 専門教育では、まず、学部共通の「専門基礎科目」を通して、生物及び生物圏に関わる専門基礎力を養成する。この中には、海外演習、インターンシップ、フィールド演習、科学技術倫理学も含まれ、国際社会及び地域社会において指導的な活動をするための想像力と実践性を備えた基礎力、並びに研究上の不正行為の問題性と研究者・技術者倫理の重要性を理解する能力を養成する。</p> <p>3. 本プログラムの専門教育では、水生無脊椎動物および魚類の生理、病理、生化学、分子、生態、行動、資源等に関する「専門科目」を通して、これら水生生物を総体的に理解できる能力、および当該分野の「演習」や「実験実習」を通じて、実践的に応用・活用できる技能や姿勢を修得する教育を実施する。さらに「卒業論文」により、コミュニケーション・プレゼンテーション・実践的外国語能力も含めた総合的な問題解決能力を身につけた人材を養成する。</p> <p>4. 学修の成果は、各科目の成績評価と共に本プログラムで設定する到達目標への到達度の2つで評価する。</p>	<p>ethics.</p> <p>Through the specialized education in this program, the student is required to acquire:</p> <p>8. Knowledge regarding aquatic organisms, fisheries, and the hydrospheric environment, and an understanding of how to manage aquatic resources and use aquatic products;</p> <p>9. The ability to understand the theory necessary for compatibility between fisheries and maintenance of the hydrospheric environment, and to analyze and evaluate the characteristics of an aquatic organism using the methods of physiology, biochemistry, and molecular biology;</p> <p>10. The ability to handle aquatic organisms based according to their characteristics, and to manage and use valuable aquatic resources for practical purposes from a multidisciplinary perspective, while respecting engineering and research ethics; and</p> <p>11. The ability to organize his/her own ideas about specific phenomena related to aquatic organisms, to express them logically, orally and/or in writing, and to discuss them.</p>				
<p>5. 開始時期・受入条件</p> <p>生物生産学部では、生物生産学科として一括して入学試験を行う。入学後、1年次前・後期および2年次前期において、全学向けに開講されている教養教育科目（教養ゼミ・平和科目・パッケージ別科目・外国語科目・情報科目・領域科目・健康スポーツ科目）を中心に履修する。水産生物科学主専攻プログラムへの実質的な配属時期は、2年次後期である。</p> <p>学生は入学後の1年間、基盤科目を履修し、専門分野を学ぶために必要な基礎的知識を学修する。その後、2年次の前期では、生物生産学部共通に関わる専門基礎科目を中心に履修する。特に、生物生産学部共通の実験科目として、基礎化学実験、基礎物理学実験、基礎生物学実験Ⅰ・Ⅱ（コンピューター演習を含む）を履修し、生物生産学部共通で必要とされる幅広い分野における基礎的な実験トレーニングを行う。この2年次前期までに、幅広い教養と、英語等の語学能力や情報処理能力、生物生産学部として共通の基礎的知識やフィールド科学分野の実践、生命倫理や技術者倫理を修得するとともに、各学生が、各主専攻プログラムの教育目標、特徴等を十分理解し、最適な主専攻プログラムを選択する。</p> <p>生物生産学部には、生物圏環境学、水産生物科学、動物生産科学、食品科学および分子細胞機能学の5つのコースがあり、それぞれが生物圏環境学、水産生物科学、動物生産科学、食品科学および分子細胞機能学という5つの同名のプログラムを提供している。2年次後期に、本人の希望と成績により、以下の「コース分属方法」によって、5つのコースに分属する。各コースに分属された学生は、同名のプログラムを主専攻プログラムとして履修する。</p> <p>（コースへの分属方法）</p> <p>その年度の分属対象者を各コースの特任教員を除いた教員数を基準に比例配分して各コースに分属することを原則とする。ただし、小数点以下は繰り上げる。</p> <p>参考教員数（平成29.4.1現在）： 生物圏環境学（12）、水産生物科学（15）、動物生産科学（15）、食品科学（12）、分子細胞機能学（10）</p> <p>なお、各コースに分属されるためには、規定の「コース分属要件」を満たさなければならない。</p>	<p>4. Curriculum policy (policy for organizing and implementing the curriculum)</p> <p>To enable students to achieve the targets that have been set for the Fisheries Biology Program, the curriculum is organized and implemented according to the following policies:</p> <p>1. Liberal arts education courses aim to impart wide-ranging and in-depth education and general intelligence, and to foster deep humanity with a desire for peace. They also aim to develop practical foreign language abilities, an international perspective, the ability to understand different cultures, and the ability to utilize information and communication. In addition to this, courses in basic subjects are integrated into the liberal arts education in order to develop the basic scientific knowledge and skills required for application in any of the specialized fields of applied biological science.</p> <p>2. Specialized education courses develop the basic capabilities related to organisms and the biosphere through the "specialized fundamental subjects" that are common to all programs in the School of Applied Biological Science. The courses include overseas exercises, internships, fieldwork, and lectures regarding ethics in science and engineering, in order to develop the imagination and practical basic capabilities required for working in a leading position in the international and/or local community. The courses also aim to develop the ability to understand problems regarding research misconduct, and the importance of research and engineering ethics.</p> <p>3. The courses in specialized education for this program provide the "specialized subjects" related to the physiology, pathology, biochemistry, molecules, ecology, ethology, and use as resources of aquatic invertebrates and fish, in order to enable students to understand aquatic organisms in an integrated manner. Also, the courses in "exercises" and "experimentation and practice" in related areas are provided in order for students to acquire the skills and attitudes to practically apply and make use of their results. In addition to this, students develop general capabilities for problem solving, including skills for communication, presentation, and practical foreign language abilities, while preparing their "graduation thesis."</p> <p>4. The achievement in education is evaluated based on the grade scores for the subjects and the achievement level against the target set for this program.</p>				
<p>6. 取得可能な資格</p> <p>○ 教育職員免許状の資格</p> <p>1. 高等学校教諭（理科）一種免許</p> <p>○ 学芸員の資格</p> <p>○ 食品衛生管理者および食品衛生監視員の任用資格</p> <p>※取得に関する詳細は、「学生便覧」を参照すること。</p>	<p>5. Start time and acceptance conditions</p> <p>The School of Applied Biological Science holds the entrance examination together with the Department of Applied Biological Science. In the first and second semesters of the first year and the first semester of the second year, students mainly take the liberal arts subjects that are common to the whole university (educational seminars, subjects related to peace, package subjects, foreign languages, data processing, area subjects, and subjects related to health and sports). Assignment of students to the Fisheries Biology Program is conducted in the second semester of the second year.</p> <p>Students study the basic subjects for one year after entering the university, in order to acquire the basic knowledge required for studying the specialized fields. They then mainly study the specialized basic subjects common to all students of the School of Applied Biological Science in the second semester of the second year. In particular, they take the subjects Laboratory Work in General Chemistry, Laboratory Work in General Physics, and Laboratory Work in General Biology I & II (including computer exercises), since these relate to experimentation, are common to all students of the School of Applied Biological Science, and consist of receiving the basic training in a wide range of experimentation procedures that is commonly required for the students of the School of Applied Biological Science. By the first semester of the second year, students acquire a wide-ranging education, ability in foreign languages such as English, data processing skills, the basic knowledge common to students of the School of Applied Biological Science, and an understanding of bioethics and engineering ethics, in order to allow them to understand the aim and characteristics of each major program and select the most appropriate program.</p> <p>The School of Applied Biological Science comprises five courses, i.e. the Integrated Ecoscience Course, the Fisheries</p>				
<p>7. 授業科目及び授業内容</p> <p>※授業科目は、別紙1の履修表を参照すること。（履修表を添付する。）</p> <p>※授業内容は、各年度に公開されるシラバスを参照すること。</p>					
<p>8. 学修の成果</p> <p>各学期末に、学修の成果の評価項目ごとに、評価基準を示し、達成水準を明示する。</p> <p>各評価項目に対応した科目の成績評価をS=4, A=3, B=2, C=1と数値に変換した上で、加重値を加味し算出した評価基準値に基づき、入学してからその学期までの学修の成果を「極めて優秀(Excellent)」、「優秀(Very Good)」、「良好(Good)」の3段階で示す。</p> <table border="1" data-bbox="97 1982 632 2053"> <tr> <td>学修の成果</td> <td>評価基準値</td> </tr> <tr> <td>極めて優秀(Excellent)</td> <td>3.00～4.00</td> </tr> </table>	学修の成果	評価基準値	極めて優秀(Excellent)	3.00～4.00	
学修の成果	評価基準値				
極めて優秀(Excellent)	3.00～4.00				

優秀 (Very Good)	2.00～2.99
良好 (Good)	1.00～1.99

成績評価	数値変換
S (秀: 90点以上)	4
A (優: 80～89点)	3
B (良: 70～79点)	2
C (可: 60～69点)	1

※別紙2の評価項目と評価基準との関係を参照すること。
 ※別紙3の評価項目と授業科目との関係を参照すること。
 ※別紙4のカリキュラムマップを参照すること。

9. 卒業論文 (卒業研究) (位置づけ, 配属方法, 時期等)

○目的
 本プログラムにおける卒業研究とは、これまで習得してきた知識ならびに技術を最大限に活用する集大成の場である。卒業研究を通じて学生は、水産生物科学の専門領域について深い理解を得るとともに、研究プロセスを体験することによって、研究を行う上で必要な基本的知識、技術、態度を身につける。

○概要
 卒業研究の内容は配属される研究室あるいは研究テーマにより異なり、フィールドでの調査を主体とするものもあれば室内での実験に限定されるものもある。各研究室の卒業研究課題は、集中ガイダンスおよび各教員による個別説明により周知させる。卒業研究では、研究に必要な基本的精神、モラル等を学ぶとともに、指導教員の指導のもと、研究を立案計画し、研究実験手法を学び、研究を実施する。また、得られた研究結果を考察し、さらなる研究目標を立てる。学生は、一連の研究を体験することにより、研究の面白さを味わい、定められた期日までに卒業論文としてまとめる。また、主専攻プログラム全体で卒業論文発表会を実施する。

○配属方法・時期
 1. 配属時期は、3年次後期とする。
 2. 配属は、水産生物科学コースが定めた規程の配属方法に従い、学年の担当チューターの指導のもと行う。
 本プログラムの配属方法は、担当チューターの指示に従い、学生が積極的に配属したい研究室を選択できるようにガイダンスを行う。まず、担当チューターが、2年次に各教員の専門をガイダンスにより周知させ、2年次以降、学生に卒業論文発表会や修士論文発表会に参加するよう指導し、各教員の研究内容を理解させる。また、学生は、3年次前期に前もって各研究室を訪問し、卒業論文の内容や研究室の状況を把握する。
 担当チューターは、3年次前期に各研究室の研究テーマ、配属人数の上限を説明する資料等を配付した後、配属希望調査を行う。配属は、原則として、指導予定教員の合意のもとに、担当チューターが調整を行う。

Biology Course, the Animal Science Course, the Food Science Course, and the Applied Molecular and Cellular Biology Course, and each of these provides an educational program under the same name as its course name, i.e. the Integrated Ecoscience Program, the Fisheries Biology Program, the Animal Science Program, the Food Science Program, and the Applied Molecular and Cellular Biology Program. The student is allocated to one of the five courses based on his/her wishes and level of achievement, according to the "course allocation method" described below. The allocated student takes the program with the name of the course to which he/she is allocated as his/her major program.

(Course allocation method)

Students who are to be allocated to the courses in a given year are allocated to each course proportionally to the number of faculty members, excluding specially appointed faculty members, for each course. In making these calculations, digits after a decimal point are rounded up.

Number of faculty members (as of April 1, 2017):

Integrated Ecoscience Course (12), Fisheries Biology Course (15), Animal Science Course (15), Food Science Course (12), and Applied Molecular and Cellular Biology Course (10)

The student must meet the specified "requirements for allocation to the course" in order to be allocated to the course.

6. Obtainable qualifications

- Educational personnel certification
 1. Type 1 License for High School Teacher (Science)
- Curator License
- Appointment qualification for food sanitation supervisor and food sanitation inspector

* For details of acquisition of these qualifications, refer to the "Student Handbook."

7. Class subjects and their contents

- * For the class subjects, refer to the subject table in Attachment 1. (The subject table is to be attached.)
- * For the details of the class subjects, refer to the syllabus that is published for each academic year.

8. Academic achievement

The evaluation criteria are specified for each evaluation item for academic achievement, and the level of achievement against the criteria is given at the end of the semester.

The evaluation score for each evaluation item is converted to a numerical value (S = 4, A = 3, B = 2, and C = 1) and the evaluation standard for academic achievement, from the time the student entered the university to the end of the current semester, is determined using these values while applying weightings. The evaluation standard values correspond to three levels, i.e. Excellent, Very Good, and Good.

Study achievement	Evaluation standard
Excellent	3.00 - 4.00
Very Good	2.00 - 2.99
Good	1.00 - 1.99

Achievement evaluation	Numerical conversion
S (Excellent: 90 or more points)	4
A (Very good: 80 - 89 points)	3
B (Good: 70 - 79 points)	2
C (Passed: 60 - 69 points)	1

- * Refer to the relationship between evaluation items and evaluation criteria described in Attachment 2.
- * Refer to the relationship between evaluation items and class subjects described in Attachment 3.
- * Refer to the curriculum map in Attachment 4.

9. Graduation thesis (graduation research) (meaning, student allocation, timing, etc.)

○ Purpose
 The graduation research in this program is the stage at which students demonstrate fully the knowledge and skills they have acquired since entering the university. In their graduation research, students deepen their understanding of the specialty fields of fisheries biology and gain experience in research processes, in order to acquire the basic knowledge, skills, and attitude required for research activities.

10. 責任体制

(1) PDCA責任体制 (計画(plan)・実施(do)・評価 (check)・改善 (action))

1. 計画 (plan) ・実施(do)は、学部教務委員会および講義担当者が行う。
2. コースは、責任を持って主専攻プログラムを計画・実施する。その責任者としてコース主任を置く。
3. 学部教務委員会は、学部で実施される主専攻プログラムを統括する。
4. 学部教務委員会は、各コースから選出された5名の委員と学部から選出された委員長等からなる。
5. 評価検討(check)は、教育改革推進委員会が行う。
6. 教育改革推進委員会は、各コースから選出された5名の委員と学部から選出された委員長、学部教務委員長、研究科長補佐からなる。
7. 教育改革推進委員会は、各コースが実施した主専攻プログラムの評価検討を行い、その結果を学部教務委員会、コースに報告し、助言・勧告を行う。
8. 対処(action)は、主専攻プログラムの実施責任母体であるコース委員会が行う。
9. コース委員会、学部教務委員会は、教育改革推進委員会が行った評価検討後の報告および助言・勧告を尊重し、改善のための計画案を作り、実施する。

コース委員会、学部教務委員会、教育改革推進委員会は、各役割を責任もって実行し、お互いに連携をとりながら、学部教育の計画(plan)・実施(do)・評価検討(check)・対処(action)を行い、学部教育の改善に勤める。

(2) プログラムの評価

(a) プログラム評価の観点

本プログラムでは、「教育的効果」と「社会的効果」を評価の観点とする。

「教育的効果」では、プログラムの実施に伴う学生の学修効果を判定する。

「社会的効果」では、プログラムの学修結果の社会的有効性を判定する。

(b) 評価の実施方法

本プログラムでは、上記の評価の観点に従い、4年次後期にプログラムの成果を評価する。

「教育的効果」に関しては、本プログラムを学修した学生の成績および到達度について、実施した教員グループによる総合的な評価を行う。単位充足率および教員の総合評価に基づいて、各学生のプログラム達成水準を評価する。また、学生全体のプログラム達成水準を評価し、点検する。

「社会的効果」に関しては、本プログラムの内容と密接に関連する企業（食品・医薬品・化学等）への就職率、公務員試験合格率等を調べ、評価を行う。一定期間毎に、学生の主に就職する企業の人事担当者に本プログラムの評価を依頼する。さらに、卒業生にも、当人の自己評価および本プログラムの評価を依頼する。企業および卒業生に依頼するプログラムの評価の内容は、本プログラムの各授業科目およびその内容が社会的活動を行う上で有益であったか、授業内容が科学技術の変化や社会の変化に対応しているか、今後必要となる授業科目はないか等について、評価や意見を求める。

(c) 学生へのフィードバックの考え方とその方法

教育改革推進委員会は、一定期間毎に、学生へのアンケートやヒアリングを行い、プログラムを点検・評価するとともに、プログラム内容の見直し、改善のための助言・勧告を行う。

○ Overview

Contents of the graduation research varies with the laboratory to which the student is allocated and the topic which he/she focuses on. Some research mainly consists of field studies, while other research consists of only indoor experiments. The themes for graduation research in each laboratory are explained through the focused guidance and explanation given by each teacher. In graduation research, students learn the fundamental spirit and ethic required for research activities, establish a plan for the research, study the methods needed for the research and experiments, and carry out the research under the instruction of their mentor. Furthermore, students review the results obtained in the research and identify targets for further research. Students acquire an interest in research activities while gaining experience in a series of research processes, and prepare their graduation thesis by the specified date. Also, students present the results of their research at the graduation thesis presentation assembly, which is held for the whole of the major program.

○ Student allocation method and timing

1. Students are allocated to a laboratory in the second semester of the third year.
2. Students are allocated to a laboratory under the guidance of the tutor in charge, according to the allocation method stipulated for the Fisheries Biology Course.

In our program, guidance is provided by the tutor in charge to allow students to positively choose the laboratory to which he/she is to be allocated. At first, the tutor explains to students in the second year the specialties of each faculty member. Then students are instructed to attend the presentation assembly for graduation theses and master's theses, in order to understand the details of the research undertaken by each faculty member. Students visit laboratories when they are in the first semester of the third year, to learn the details of the graduation thesis and situation in the laboratory.

The tutor hands out materials that describe topics for the graduation thesis and the limit for the number of students to be allocated to each laboratory, and then considers each student's wishes. In principle, assignment is coordinated by the tutor in charge, with the agreement of the faculty members who are going to teach the students.

10. Responsibility

(1) Responsibility for PDCA (plan, do, check, and act) cycle

1. The education affairs committee of school and the faculty members who provide the lectures are engaged in the "plan" and "do" processes.
2. Each course has responsibility for planning and executing its major program. A chief faculty member is designated as the supervisor of the course.
3. The education affairs committee of the school exercises control over the major programs provided by the school.
4. The education affairs committee of the school consists of five members who are elected from each course, and a chairman who is chosen by the school.
5. The education reform promotion committee is engaged in the process of "check."
6. The education reform promotion committee consists of five members who are elected from each course, a chairman who is chosen by the school, the chairman of the education affairs committee of the school, and an assistant chief of the graduate course.
7. The education reform promotion committee reviews and evaluates the major programs provided in each course, reports the results to the education affairs committee of the school and the courses, and provides advice and recommendations.
8. The course committee that takes the responsibility for execution of the major program is engaged in the process of "act."
9. The course committee and the education affairs committee of the school prepare and execute a plan for improvement taking into consideration the report, advice, and recommendations that are provided by the education reform promotion committee after the "check" process.

The course committee, the education affairs committee of the school, and the education reform promotion committee cooperate with one another to execute their roles with responsibility in the "plan", "do", "check", and "act" cycle in order to improve the education provided by the school.

(2) Evaluation of program

(a) Viewpoint for evaluation of program

The Fisheries Biology Program is evaluated from the viewpoints of "educational effectiveness" and "social effectiveness."

The "educational effectiveness" is evaluated by the effect of the implementation of the program on the educational achievement of students.

The "social effectiveness" is evaluated by the effect of educational achievement in the program on society.

(b) Evaluation method

In the Fisheries Biology Program, achievement in the program is evaluated from the perspectives described above for students in the second semester of the fourth year.

For "educational effectiveness", the results and achievements of the students who took the program are evaluated comprehensively by the group of faculty members who are engaged in the execution of the program. Also, the level of achievement of all the students is evaluated and reviewed.

"Social effectiveness" is evaluated based on such things as the rate of employment in corporations that have a close connection with the contents of this program, and the pass rate in public servant examinations. We regularly request a member of human resources staff from a company that mainly employs students from this program to evaluate the program. In addition to this, we request graduates of this program to evaluate their own achievement and that of the program. The staff working in companies and other graduates are requested to provide evaluation and advice regarding whether the class subjects and their contents in this program had a positive effect on their social activities, whether the contents of the classes appropriately corresponded to changes in science, technology, and society, and any additional class subject that may be required in the future.

(c) Policy and method for feedback to students

The education reform promotion committee regularly conducts surveys and interviews for students to review and evaluate the program, improve the contents of the program, and provide advice and recommendations for improvement.

○ Table of Registration Standards for Major Programs in the Fisheries Biology Course
(Specialized Subjects)

Type	Subject type	Required No. of credits	Class subjects	No. of credits	Year in which the subject is taken									
					1st grade		2nd grade		3rd grade		4th grade			
					Spring	Fall	Spring	Fall	Spring	Fall	Spring	Fall		
Specialized Education Subjects	Specialized Subjects	5 6	Introduction to Fisheries Biology	2				○						
			Aquatic Animal Physiology	2				○						
			Fish Pathology	2				○						
			Fisheries Ecology	2				○						
			Aquatic Biochemistry	2				○						
			Marine Invertebrate Zoology	2				○						
			Laboratory Work in Applied Marine Biology I	1				○						
			Laboratory Work in Aquatic Biochemistry	1				○						
			Aquaculture	2						○				
			Laboratory Work in Applied Marine Biology II	1						○				
			Field Works and Experiments of Marine Fisheries Science in "Sato Umi"the Seto Inland Sea	1						○				
			Laboratory Work in Aquatic Botany	1						○				
			Field Work on Training Vessel	2						○				
			Graduation Thesis	6										○
Required subjects: 27 total credits														

			Aquatic Molecular Biology	2					○		
			Introduction to International Fishery	2					○		
			Behavioral Ecology of Fish	2					○		
			Benthic Ecology	2					○		
			Coastal Fisheries Ecology	2					○		
			Conservation Sciences of Marine Algal Resources	2					○		
			Specialized Practical Work in Marine Biology	1							○
			<p>Elective or required subjects: 10 credits are required from a total of 13 credits. (Credits obtained beyond the 10 credits shall be regarded as credits obtained in elective subjects)</p>								

		Plankton Ecology	2			○			
		Seafood Chemistry and Biochemistry	2			○			
		Nutrition	2			○			
		Biological Oceanography	2				○		
		Marine Environmental Science	2					○	
		Laboratory and Field Works in Marine Biology	1					○	
		Immunobiology	2					○	
		Marine Bioresources Chemistry	2					○	
		Food Production Management	2					○	
		Laboratory and Field Works of Environmental Biology	1						○
		<p>Elective subjects: At least 19 credits must be obtained.</p> <ul style="list-style-type: none"> • Students are required to take subjects from elective subjects of the Program appearing in the Table. • Specialized subjects from other Applied Biological Science programs outside the table can be included in the elective subjects. • Up to 12 credits obtained from specialized subjects at another School and from subjects offered by the AIMS Program completed at the dispatch destination can be included in the credits required for graduation. • Credits obtained from Liberal Arts Education Subjects and subjects related to the teaching profession cannot be included in the credits required for graduation. 							
	合計	124							

[No. of credits required for graduation]

124 credits (Liberal Arts Education Subjects: 44 credits + Basic Specialized Subjects: 24 credits + Specialized Subjects: 56 credits)

Academic achievements of Fisheries Biology Program

Relationships between the evaluation items and evaluation criteria

Academic achievements		Evaluation criteria		
Evaluation items		Excellent	Very Good	Good
Knowledge and Understanding	(1) To acquire abilities for considering academically and comprehensively, and examining and acting from a broad perspective required for find solutions to the problems relating a specialty.	To have excellent abilities for considering academically and comprehensively, and examining and acting from a broad perspective.	To have adequate abilities for considering academically and comprehensively, and examining and acting from a broad perspective.	To have basic abilities for considering academically and comprehensively, and examining and acting from a broad perspective.
	(2) To understand basic knowledge required for learning a specialty. Also, to understand the knowledge.	To have basic knowledge, deeply understand and give advanced explanations by linking them with other items.	To have basic knowledge, adequately understand and give explanations by linking them with other items.	To have basic knowledge, roughly understand and give basic explanations.
	(3) To comprehensively understand the morphological, ecological, physiological, pathological, biochemical and genetical characteristics for various aquatic organisms.	To have basic knowledge, deeply understand and give advanced explanations by linking them with other items.	To have basic knowledge, adequately understand and give explanations by linking them with other items.	To have basic knowledge, roughly understand and give basic explanations.
	(4) To understand the management, cultivation and product utilization of aquatic resources, and the economic trend of fisheries.	To have basic knowledge, deeply understand and give advanced explanations by linking them with other items.	To have basic knowledge, adequately understand and give explanations by linking them with other items.	To have basic knowledge, roughly understand and give basic explanations.
	(5) To understand the physiological, pathological, biochemical and genetical backgrounds required for the management and cultivation of aquatic resources.	To have basic knowledge, deeply understand and give advanced explanations by linking them with other items.	To have basic knowledge, adequately understand and give explanations by linking them with other items.	To have basic knowledge, roughly understand and give basic explanations.
	(6) To understand the morphology and ecology of aquatic organisms in relation to hydrospheric environment.	To have basic knowledge, deeply understand and give advanced explanations by linking them with other items.	To have basic knowledge, adequately understand and give explanations by linking them with other items.	To have basic knowledge, roughly understand and give basic explanations.

Academic achievements		Evaluation criteria		
Evaluation items		Excellent	Very Good	Good
Abilities and Skills	(1) To acquire abilities of basic communication, information processing, and physical activity.	To have excellent abilities concerning the following elements: basic communication, information processing, and physical activity.	To have adequate abilities concerning the following elements: basic communication, information processing, and physical activity.	To have basic abilities concerning the following elements: basic communication, information processing, and physical activity.
	(2) To acquire abilities and skills of basic experiment needed to learn a specialty.	To have adequate abilities and skills of basic experiment, and being able to independently advance.	To have adequate abilities and skills of basic experiment, and being able to do according to the directions.	To have rough abilities and skills of basic experiment, and being able to do assistance.
	(3) To acquire skills for analyzing and evaluating various characteristics of aquatic organisms and hydrospheric environment.	Being able to independently analyze and evaluate various characteristics of aquatic organisms and hydrospheric environment.	Being able to analyze and evaluate various characteristics of aquatic organisms and hydrospheric environment according to the directions.	Being able to roughly analyze and evaluate various characteristics of aquatic organisms and hydrospheric environment according to the directions.
	(4) To acquire basic skills and analyzing method for rearing aquatic organisms.	To have adequate basic skills and analyzing method for rearing aquatic organisms, and being able to independently advance.	To have basic skills and analyzing method for rearing aquatic organisms, and being able to do according to the directions.	To have rough basic skills and analyzing method for rearing aquatic organisms, and being able to do assistance.
	(5) To acquire skills for analyzing and evaluating the role of fishery in human life and the effect on hydrospheric environment.	Being able to independently analyze and evaluate the role of fishery in human life and the effect on hydrospheric environment.	Being able to analyze and evaluate the role of fishery in human life and the effect on hydrospheric environment according to the directions	Being able to roughly analyze and evaluate the role of fishery in human life and the effect on hydrospheric environment according to the directions
	(6) With regard to aquatic organisms, to be acquire reading and communication abilities in English.	To have very high reading comprehension in English, which is able to read specific academic articles, and acquiring sufficiently and deeply international communication abilities.	To have high reading comprehension in English, which is able to adequately read specific academic articles, and acquiring sufficiently and deeply international communication abilities.	To have reading comprehensions in English, which is able to partially read specific academic articles, and acquiring sufficiently and deeply international communication abilities.
Comprehensive Abilities	(1) With regard to specific phenomena of aquatic organisms, to be able to find targets, summarize opinions, deliver presentations or reports logically,	To have excellent utilize abilities and skills concerning the following elements: to set up a target, information processing, summarizing statistical data, logical expression and responsive communication.	To have adequate utilize abilities and skills concerning the following elements: to set up a target, information processing, summarizing statistical data, logical expression and responsive communication.	To have basic utilize abilities and skills concerning the following elements: to set up a target, information processing, summarizing statistical data, logical expression and responsive communication.

Placement of the Liberal Arts Education in the Major Program

The liberal arts education in this Program plays the role of creating an academic foundation for specialized education to enable students to develop a voluntary and independent learning attitude; to cultivate scientific thinking based on their ability to gather information, their analytical capacity, and critical powers; to gain deep insight into the nature of and background to things from a broad perspective; to strengthen their language skills to enable them to live as an international person and to develop their interest in peace; to integrate their extensive knowledge into a body of knowledge truly useful for solving problems; and to develop the ability to look at things from a comprehensive perspective.

Academic achievements		1st grade		2nd grade		3rd grade		4th grade	
Evaluation items		Spring semester	Fall semester	Spring semester	Fall semester	Spring semester	Fall semester	Spring semester	Fall semester
Abilities and Skills		Health and Sports Courses (○)							
	To acquire abilities and skills of basic experiment needed to learn a specialty.	Experimental Methods and Laboratory Work in Physics (○)		Laboratory Work in General Biology I, II (◎)					
		Experimental Methods and Laboratory Work in Chemistry (○)		Basic Experiments in Chemistry (◎)					
		Experimental Methods and Laboratory Work in Biology (○)		Laboratory Work in General Physics (◎)					
	To acquire skills for analyzing and evaluating various characteristics of aquatic organisms and hydrospheric environment.				Laboratory Work in Applied Marine Biology I (◎)	Laboratory Work in Applied Marine Biology II (◎)	Laboratory and Field Works in Marine Biology (○)	Laboratory and Field Works of Environmental Biology (○)	
					Laboratory Work in Aquatic Biochemistry (◎)	Field Works and Experiments of Marine Fisheries Science in "Sato" (◎)		Specialized Practical Work in Marine Biology (○)	
						Laboratory Work in Aquatic Botany (◎)			
	To acquire basic skills and analyzing method for rearing aquatic organisms.				Laboratory Work in Applied Marine Biology I (◎)	Laboratory Work in Applied Marine Biology II (◎)			
					Laboratory Work in Aquatic Biochemistry (◎)	Field Works and Experiments of Marine Fisheries Science in "Sato" (◎)			
						Laboratory Work in Aquatic Botany (◎)			
To acquire skills for analyzing and evaluating the role of fishery in human life and the effect on hydrospheric environment.					Field Works and Experiments of Marine Fisheries Science in "Sato" (◎)		Specialized Practical Work in Marine Biology (○)		
					Field Work on Training Vessel (◎)				
With regard to aquatic organisms, to be acquire reading and communication abilities in English.					Reading of Foreign Literature (◎)	Graduation Thesis (◎)			
Comprehensive	With regard to specific phenomena of aquatic organisms, to be able to find targets, summarize opinions, deliver presentations or reports logically, and answer questions.					Reading of Foreign Literature (◎)	Graduation Thesis (◎)		

Liberal Arts Education Subjects

Basic Specialized Subjects

Specialized Education Subjects

Graduation Thesis

(◎) Required (○) Elective/required (△) Free elective