Integrative Evolutionary Science

Course Code	Course	Credit	Content of Subject
40COM013**	Life Science Retreat I	1	Students and faculty members who are involved in life science research gather for academic exchanges. First-year students in the Five-year Doctoral Program present their research plan and progress.
40COM014**	Life Science Retreat II	1	Students and faculty members who are involved in life science research gather for academic exchanges. Second-year students in the Five-year Doctoral Program present their research progress.
40COM015**	Life Science Retreat III	1	Students and faculty members who are involved in life science research gather for academic exchanges. Third-year students in the Five-year Doctoral Program or first-year students in the Three-year Doctoral Program present their research plan and/or progress.
40COM016**	Life Science Retreat IV	1	Students and faculty members who are involved in life science research gather for academic exchanges. Fourth-year students in the Five-year Doctoral Program or second-year students in the Three-year Docctoral Program present their research progress.
40COM017**	Life Science Retreat V	1	Students and faculty members who are involved in life science research gather for academic exchanges. Fifth-year students in the Five-year Doctoral Program or third-year students in the Three-year Docctoral Program present their research progress.
40IES001**	Introduction to Philosophy of Science	1	Philosophy of science analyses methodologies, cencepts, and nature of science. In this lecture, we will discuss topics from philosophy of science that will help to understand nature of science..【Not offered in 2025】
40IES002**	Science, Technology and Society	1	Through lectures on historical, philosophical, and sociological aspects of science and technology, this course provides students with an opportunity to consider and discuss the social impacts of their own research and research activity in general.【Not offered in 2025】
40IES003**	Micro- and Macro-scopic Biology	2	To learn the basics of theoretical biology, evolutionary biology, integrative anthropology, and neurobiology in order to comprehensively understand the mechanisms of evolution.
40IES004**	Life Science & Society	1	This course explores ethical and social issues surrounding the current life science studies, through lectures with historical, philosophical, and sociological perspectives.
40IES005**	Introduction to the "Science & Society" Sub-thesis	1	This course is designed to provide students with working steps necessary to produce a research proposal for the sub-thesis. Each student is expected to develop an individual thesis topic based on his/her interest and submit written pieces including the final draft of the proposal.

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40IES006**	Introduction to the ″Biological Science″ Sub-thesis	1	This course is designed to provide students with working steps necessary to produce a research proposal for the sub-thesis. Each student is expected to develop an individual thesis topic based on his/her interest and submit written pieces including the final draft of the proposal.
40IES007**	Introduction to Science and Technology Studies	1	Please refer to the WebSyllabus 2025
40IES008**	Biostatistics	2	Introductory lectures on basic theories of statistical analysis with practical work on biological data using statistical packages.
40IES009**	Integrative Evolutionary Biology	2	Biosystems on the earth can be classified into systems with different levels of complexity, from a cell to society. This course is to discuss evolution of such systems from the viewpoints of ″elements (members) in each system″, ″interaction between elements″ and ″theory to describe this interaction″.
40IES010**	Integrative Anthropology	1	Introduction to various fields of anthropology, including bioanthropology, cultural anthropology, archaeology, primatology, and human behavioral ecology. The lecture will discuss both the biological and social aspects of humans, with particular focus on the relationship between environment and humans.
40IES011**	Environmental Archaeology	1	Learn various methods in environmental archaeology and discuss about the relationship between humans and environment in the past. Introduction to analytical methods in zooarchaeology and ethnoarchaeobotany including laboratory practice.【Not offered in 2025 】
40IES012**	Human Genetics	1	This course is to introducve how the origin of the human beings is understood through genetics. We discuss how far the acquisition of human specificity is explained genetically and how far the genetic diversity of the present human beings are clarified with the latest research results. We will also discuss the role of genetic approaches in the development of physical anthropology. 【Not offered in 2025 】
40IES013**	Evolutionary Physiology	1	An overview of physiological traits from the viewpoint of molecular evolution. Evolution of genes for sensory receptors, immune molecules, and components in metabolic pathways are addressed.
40IES014**	Cell Biology	1	Topics in molecular cytogenetics. A series of lectures will include molecular structure and function of the intra-cellular supermolecules, DNA, chromatin, and chromosomes in relation to cell cycle dynamics, gene expression, epigenetics, genome evolution, and medical genetics. Lectures will be also given on the recent research trends in the related research fields. .【Not offered in 2025】

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40IES015**	Evolutionary Behavioral Ecology	1	This lecture aims to explain both ultimate and proximate approaches for understanding animal behaviour. Particularly, I will talk about fundamental concepts and types of approaches with empirical examples. Students need to read important literatures for discussion. 【Not offered in 2025】
40IES016**	Biological Anthropology	1	Biological anthropology is a discipline that comprehensively investigates "humans as living organisms" from the perspective of evolution and diversity. In this lecture, we will learn what humans are through the results of research on human evolution, comparative analysis with non-human primates, and analysis of archaeological materials. We will also learn mismatches, that appear in modern society, of human characteristics acquired through evolution, and consider how the findings of biological anthropology can be useful for us to experience a richer life, love, child-rearing, and aging.
40IES017**	Laboratory of Basic Biology	2	Laboratory courses. The program will include fields; ecology, molecular biology, cellular biology, histology, physiology, computer programming and scientific writing.
40IES018**	Integrative Evolutionary Science Academic English (Basic) 1	1	This course is based on an education program developed by scientists at NIG. It aims to improve various skills necessary for scientific presentation and discussion. Students will receive advice and guidance from a native speaker of English. The basic course covers topics such as structure of oral presentations and useful phrases for discussions. 【Not offered in 2025】
40IES019**	Integrative Evolutionary Science Academic English (Basic) 2	1	This course is based on an education program developed by scientists at NIG. The contents cover various issues and weak points that are frequently observed in scientific situations. Ample opportunity is provided to practice various skills necessary for various aspects of scientific presentation and discussion. Students will receive advice and guidance from a native speaker of English. The basic course covers topics such as structure of oral presentations and useful phrases for discussions. In the advanced course, students will learn more specific skills about explanation of slides and discussions, and exercise these skills thorough making presentations of their research.【Not offered in 2025】
40IES020**	Integrative Evolutionary Science Academic English (Advance) 1	1	This course is based on an education program developed by scientists at NIG. It aims to improve various skills necessary for scientific presentation and discussion. Students will receive advice and guidance from a native speaker of English. In the advanced course, students will learn more specific skills about explanation of slides and discussions, and exercise these skills thorough making presentations of their research.

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40IES021**	Integrative Evolutionary Science Academic English (Advance) 2	1	This course is based on an education program developed by scientists at NIG. The contents cover various issues and weak points that are frequently observed in scientific situations. Ample opportunity is provided to practice various skills necessary for various aspects of scientific presentation and discussion. Students will receive advice and guidance from a native speaker of English. The basic course covers topics such as structure of oral presentations and useful phrases for discussions. In the advanced course, students will learn more specific skills about explanation of slides and discussions, and exercise these skills thorough making presentations of their research.
40IES022**	Molecular Evolution	1	Fundamental concepts of molecular evolution (e.g., neutral theory of molecular evolution, natural selection, molecular clock) are introduced with deepening the knowledge on the pattern and underlying molecular mechanism of evolution. 【Not offered in 2025】
40IES023**	Sensory Physiology	1	Topics in sensory physiology. A series of lectures will be provided about the cellular and molecular mechanisms underlying various senses in animals. 【Not offered in 2025 】
40IES024**	Neuroethology	1	This lecture aims to explain both ultimate and proximate approaches for understanding animal behaviour. Particularly, I will talk about fundamental concepts and types of approaches with empirical examples. Students need to read important literatures for discussion. 【Not offered in 2025】
40IES025**	Mathematical Biology	1	Introduction to population demography, dynamics of interacting species, epidemics, character displacement and speciation, behavoural ecology and game theory, sexual selection, biologiical pattern formation, and stochastic process in population genetics..
40IES026**	Population Genetics	1	Population genetics primarily considers the changes of allele frequencies in a population as a factor of evolution. This class introduces the history and basic theories of population genetics, and the near–future perspective will be discussed. 【Not offered in 2025】
40IES027**	Plant Evolutionary Developmental Biology	1	Land plants have evolved their body plans differing from those of animals. In addition, land plants resiliently adapt their growth and development to various environmental conditions. This lecture will focus on land plant development and environmental adaptation at the molecular and cellular levels. 【Not offered in 2025】
40IES028**	Evolutionary Genomics	1	Please refer to the WebSyllabus 2025

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40IES029**	Population Ecology	1	Population ecology, once said by young researchers a few decades ago to have ended its role, has fully faced on the environmental problems. Conservation of endangered species and the overexploitation and its recovery of bioresources are the most important topics in biodiversity and ecosystem conservation. Population ecology has developed systematic theories as well as statistical techniques to deal with uncertainty. Due to the progress in population genetics and adaptive dynamics in evolution, population ecology is now fused with evolutionary ecology originated from the other field. In this lecture, we will introduce the basis of population ecology and its application to environmental problems, as well as the developmental process of the discipline.
40IES030**	Biodiversity	1	Biodiversity is generated by interaction of numerous number of different species. In this class, students will learn and consider the mechanism of generation and maintenance of biodiversity.
40IES031**	Evolutionary Developmental Neurobiology	1	Most multicellular animals possess a nervous system with a variety of complexity. This course introduces topics in the evolutionary origin and the diversification of the nervous system in various animals including both vertebrates and invertebrates. 【Not offered in 2025】
40IES032**	Integrative Evolutionary Science Special Seminar Series I	2	Series of eight lectures by leading scientists in various research fields selected from outsides. Each lecture includes mainly research topics with lecturer's own studies, as well as historical aspects, current status, and future prospects of the development of the research fields including the lecturer's research prospective.
40IES033**	Integrative Evolutionary Science Special Seminar Series II	2	Series of eight lectures by leading scientists in various research fields selected from outsides. Each lecture includes mainly research topics with lecturer's own studies, as well as historical aspects, current status, and future prospects of the development of the research fields including the lecturer's research prospective.
40IES034**	Integrative Evolutionary Science Special Seminar Series III	2	Series of eight lectures by leading scientists in various research fields selected from outsides. Each lecture includes mainly research topics with lecturer's own studies, as well as historical aspects, current status, and future prospects of the development of the research fields including the lecturer's research prospective.
40IES035**	Integrative Evolutionary Science Special Seminar Series IV	2	Series of eight lectures by leading scientists in various research fields selected from outsides. Each lecture includes mainly research topics with lecturer's own studies, as well as historical aspects, current status, and future prospects of the development of the research fields including the lecturer's research prospective.
40IES036**	Integrative Evolutionary Science Special Seminar Series V	2	Series of eight lectures by leading scientists in various research fields selected from outsides. Each lecture includes mainly research topics with lecturer's own studies, as well as historical aspects, current status, and future prospects of the development of the research fields including the lecturer's research prospective.

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40IES037**	Evolutionary Game Theory	1	Evolutionary game theory provides a theoretical framework for analyzing conflicts of interests among individuals. It has rich applications to problems in evolutionary ecology as well as in evolutionary studies of human behavior. This introductory course offers an overview of this theory through various examples.【Not offered in 2025】
40IES038**	STS and History of Science 1	1	IThis class is primally for students specialized in science-and-society related fields. In this class, students will read classic works in philosophy of science and practice skills essential for philosophy of sicnece research. 【Not offered in 2025】
40IES039**	STS and History of Science 2	1	Please refer to the WebSyllabus 2025
40IES040**	STS and History of Science 3	1	In this seminar, students will read both primary and secondary sources in history of science (mostly 20th century) and write a mini research paper. This class is for students specialized in "science and society."
80IES001**	Integrative Evolutionary Science Progress Report IA	1	Seminars based on progress report of students.
80IES002**	Integrative Evolutionary Science Progress Report IB	1	Seminars based on progress report of students.
80IES003**	Integrative Evolutionary Science Progress Report IIA	1	Seminars based on progress report of students.
80IES004**	Integrative Evolutionary Science Progress Report IIB	1	Seminars based on progress report of students.
80IES005**	Integrative Evolutionary Science Progress Report IIIA	1	Seminars based on progress report of students.
80IES006**	Integrative Evolutionary Science Progress Report IIIB	1	Seminars based on progress report of students.
80IES007**	Integrative Evolutionary Science Progress Report IVA	1	Seminars based on progress report of students.
80IES008**	Integrative Evolutionary Science Progress Report IVB	1	Seminars based on progress report of students.
80IES009**	Integrative Evolutionary Science Progress Report VA	1	Seminars based on progress report of students.
80IES010**	Integrative Evolutionary Science Progress Report VB	1	Seminars based on progress report of students.
80IES011**	Specific Research for Sub-thesis	4	Research for Sub thesis.

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40IES041**	Developmental Evolutionary Biology	1	What changes in developmental processes (body construction) have occurred through biological evolution, contributing to phenotypic diversification? This lecture aims to offer not only an overview and fundamental understanding of Evolutionary Developmental Biology but also delve into unresolved issues. The format of the lecture will encourage active participation through group discussions.【Not offered in 2025】
40IES042**	Marine Animal Ecology	1	Marine animals, including fish, seabirds, and marine mammals, live in environments that are markedly different from those of terrestrial animals. This lecture will discuss how marine animals maximize their fitness by examining their behavior, morphology, physiology, and responses to environmental changes.