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MEMORANDUM

ATTENTION:	Senate
FROM:	Elizabeth Elle, Vice-Chair, Senate Committee on Undergraduate Studies
RE:	Course Changes (SCUS 22-72)
DATE:	December 2, 2022

For information:

Acting under delegated authority at its meeting of December 1, 2022 SCUS approved the following curriculum revisions effective Fall 2023.

a. Beedie School of Business

(i) Prerequisite change for BUS 455 *(Summer 2023)*

(ii) Prerequisite change for BUS 413 and 465

(iii) Description and prerequisite change for BUS 424

b. Faculty of Communication, Art and Technology

1. School for the Contemporary Arts

(i) Title and description change for CA 312 and 312W

c. Faculty of Science

1. Department of Biological Sciences (SCUS 22-50c)

(i) Title change for BISC 204

(ii) Description changes for BISC 100, 101, 102, 113, 202, 204, 212, 300, 302W, 303, 305, 306, 313, 316, 317, 318, 327, 328, 333, 337, 357, 360W, 366, 410, 412, 414, 420, 421, 422, 425, 440W, 441 and 455

(iii) Prerequisite changes for BISC 100, 101, 102, 202, 204, 303, 305, 306, 313, 316, 317, 327, 328, 333, 337, 357, 366, 407, 410, 414, 422, 428, 430, 441, 445, 455 and 457

(iv) Equivalent statement changes for BISC 373

(v) Prerequisite and equivalent statement changes for BISC 113, 212, 300, 302W, 308, 309, 318, 360W, 403, 405, 412, 413, 420, 421, 423, 424, 425 and 440W

(vi) Description and prerequisite changes for BISC 205 (SCUS 22-72)

Senators wishing to consult a more detailed report of curriculum revisions may do so on the Senate Docushare repository at https://docushare.sfu.ca/dsweb/View/Collection-12682.

SENATE COMMITTEE ON UNDERGRADUATE STUDIES

COURSE MODIFICATION FORM

COURSE SUBJECT BUS **NUMBER** 413 **TITLE** Corporate Finance

TYPE OF CHANGES. Please type 'X' for the appropriate revision(s):

Course number	☐	Units	☐	Prerequisite	☒
Title	☐	Description	☐	Equivalent Statement	☐

WORDING/DESCRIPTION EDITS. Indicate deleted or changed text using ~~strike through~~, indicate added or new text using underline. If you need to enter more text than the box allows, drag the endpoint of the text box to make it bigger, as it will not automatically expand. Please review the "Equivalency statements" section under Information about specific course components if changing equivalent statement(s).

Corporate decisions in the context of financial markets. Topics include: real asset investments, financing alternatives, dividend policy, working capital management, and corporate securities valuation. Prerequisite: BUS 312, BUS 315 and~~, 316,~~ BUS 360W, all with a minimum grade of C-; 60 units.

EFFECTIVE TERM AND YEAR FOR CHANGES

Fall, Spring, Summer and year (please enter in textbox)

Fall 2023

RATIONALE (must be included)

The Finance area reviewed BUS 413 prerequisites and found that students require BUS 312 and BUS 315 to be successful in BUS 413. BUS 312 is required for all required finance courses. BUS 315 is a required course for all 400 level courses in finance as it concerns the risk/return trade-off, which is a basic concept and knowledge of the CAPM and is necessary for 400 level courses. BUS 316 is an outlier course; one can learn about derivatives without BUS 315; and on the other hand, some courses at the 400 level do not require derivative knowledge (such as the new BUS 413).

SENATE COMMITTEE ON UNDERGRADUATE STUDIES

COURSE MODIFICATION FORM

COURSE SUBJECT BUS **NUMBER** 455 **TITLE** Product & Brand Management

TYPE OF CHANGES. Please type 'X' for the appropriate revision(s):

Course number	☐	Units	☐	Prerequisite	☒
Title	☐	Description	☐	Equivalent Statement	☐

WORDING/DESCRIPTION EDITS. Indicate deleted or changed text using ~~strike through~~, indicate added or new text using underline. If you need to enter more text than the box allows, drag the endpoint of the text box to make it bigger, as it will not automatically expand. Please review the "Equivalency statements" section under Information about specific course components if changing equivalent statement(s).

Designed for students seeking a position in product management, topics include defining the role of the product manager; understanding your product as a business; organizational structures, informal networks and how the influential product manager taps into them; product lifecycles (PLC); building visibility and cross-functional teams; competitor analysis; pricing methods and the 4Ps. Prerequisites: BUS 254, ~~BUS 343,~~ BUS 345, BUS 347, and BUS 360W, all with a minimum grade of C-; 90 units. If students took Product & Brand Management as a selected topics (BUS 491, 492, 493, 494, 495, 496) they may not receive further credit for this course.

EFFECTIVE TERM AND YEAR FOR CHANGES

Fall, Spring, Summer and year (please enter in textbox)

Summer 2023

RATIONALE (must be included)

BUS 347 contains foundational knowledge for BUS 455 and is required for them to be successful in this course.

BUS345 should be added as a pre-requisite for BUS455 as well. Market research is needed because of the measuring brand equity is an important topic for this course.

COURSE SUBJECT	BUS	NUMBER	465	TITLE	Business Systems Development

TYPE OF CHANGES. Please type 'X' for the appropriate revision(s):

Course number	☐	Units	☐	Prerequisite	☒
Title	☐	Description	☐	Equivalent Statement	☐

WORDING/DESCRIPTION EDITS. Indicate deleted or changed text using ~~strike through~~, indicate added or new text using underline. If you need to enter more text than the box allows, drag the endpoint of the text box to make it bigger, as it will not automatically expand. Please review the "Equivalency statements" section under Information about specific course components if changing equivalent statement(s).

Focuses on the practical application of business technology management knowledge and skills to develop business systems. Students will learn how to apply knowledge from prior MIS courses and develop applications for Internet-enabled businesses. Students will conceptualize data and functional requirements for business software. The course will thus deepen skills in process logic, data management, and user interface design in business domains. Prerequisite: BUS 360W, BUS 362, both with a minimum grade of C-; 60 units. Recommended: BUS 464, CMPT 354. Students with credit for BUS 492 (Summer 2017) may not take this course for further credit.

EFFECTIVE TERM AND YEAR FOR CHANGES

Fall, Spring, Summer and year (please enter in textbox)

Fall 2023

RATIONALE (must be included)

This change addresses a 1224 prerequisite proof that identified no unit requirement for BUS 465 as articulated in the course outline.

COURSE SUBJECT	BUS	NUMBER	424	TITLE	Advanced Managerial Accounting

TYPE OF CHANGES. Please type 'X' for the appropriate revision(s):

Course number	☐	Units	☐	Prerequisite	☒
Title	☐	Description	☒	Equivalent Statement	☐

WORDING/DESCRIPTION EDITS. Indicate deleted or changed text using ~~strike through~~, indicate added or new text using underline. If you need to enter more text than the box allows, drag the endpoint of the text box to make it bigger, as it will not automatically expand. Please review the "Equivalency statements" section under Information about specific course components if changing equivalent statement(s).

~~Process costing; joint and by-product costing; inventory planning and control; cost accounting and statistical methods, relationship to operations research.~~

Students will familiarize themselves with the ways in which financial information is used by managers within the organization — for strategic planning, for strategic profitability analyses, for setting transfer prices, for performance measurement and evaluation, for product development decisions, etc. The emphasis is on the use (rather than the preparation) of managerial accounting information. Prerequisite: BUS 322 ~~or 319,~~ BUS 336, and BUS 360W, all with a minimum grade of C-; 60 units.

EFFECTIVE TERM AND YEAR FOR CHANGES

Fall, Spring, Summer and year (please enter in textbox)

Fall 2023

RATIONALE (must be included)

The course description is being adjusted to match course content.

SENATE COMMITTEE ON UNDERGRADUATE STUDIES

COURSE MODIFICATION FORM

COURSE SUBJECT	CA	NUMBER	312	TITLE	Selected Topics in Art and Culture Studies: Landscape

TYPE OF CHANGES. Please type 'X' for the appropriate revision(s):

Course number	☐	Units	☐	Prerequisite	☐
Title	☒	Description	☒	Equivalent Statement	☐

WORDING/DESCRIPTION EDITS. Indicate deleted or changed text using ~~strike through~~, indicate added or new text using underline. If you need to enter more text than the box allows, drag the endpoint of the text box to make it bigger, as it will not automatically expand. Please review the "Equivalency statements" section under Information about specific course components if changing equivalent statement(s).

CA 312: Selected Topics in Contemporary Arts ~~Art and Culture Studies: Landscape~~ (3)

Investigates a selected thematic topic in art and performance studies such as:~~, for example,~~ postcolonial theory and the arts; perception and embodiment; art activism and resistance; or urban art and culture. This course can be repeated twice for credit if the topic is different. Prerequisite: 45 units.

EFFECTIVE TERM AND YEAR FOR CHANGES

Fall, Spring, Summer and year (please enter in textbox)

Fall 2023

RATIONALE (must be included)

In 2021, when this course was last changed, the special topic of "landscape" was accidentally included in the course title. This form is intended to correct that error. In addition a slight change to the course description has been made so that it reads better.

SENATE COMMITTEE ON UNDERGRADUATE STUDIES

COURSE MODIFICATION FORM

COURSE SUBJECT	CA	NUMBER	312W	TITLE	Selected Topics in Art and Culture Studies: Landscape

TYPE OF CHANGES. Please type 'X' for the appropriate revision(s):

Course number	☐	Units	☐	Prerequisite	☐
Title	☒	Description	☒	Equivalent Statement	☐

WORDING/DESCRIPTION EDITS. Indicate deleted or changed text using ~~strike through~~, indicate added or new text using underline. If you need to enter more text than the box allows, drag the endpoint of the text box to make it bigger, as it will not automatically expand. Please review the "Equivalency statements" section under Information about specific course components if changing equivalent statement(s).

CA 312W: Selected Topics in Contemporary Arts ~~Art and Culture Studies: Landscape~~ (3)

Investigates a selected thematic topic in art and performance studies such as:~~, for example,~~ postcolonial theory and the arts; perception and embodiment; art activism and resistance; or urban art and culture. This course can be repeated twice for credit if the topic is different. Prerequisite: 45 units. Writing.

EFFECTIVE TERM AND YEAR FOR CHANGES

Fall, Spring, Summer and year (please enter in textbox)

Fall 2023

RATIONALE (must be included)

In 2021, when this course was last changed, the special topic of "landscape" was accidentally included in the course title. This form is intended to correct that error. In addition a slight change to the course description has been made so that it reads better.

Motion 1: To change the course title of BISC 204 from "Introduction to Ecology" to "Ecology".

Course	Title from:	Title to:
BISC 204	~~Introduction to~~ Ecology	Ecology

(Last updated: July 26, 2022)

Motion 2: To update BISC course descriptions for the following courses:

- BISC 100, 101, 102, 113
- BISC 202, 204, 212
- BISC 300, 302W, 303, 305, 306, 313, 316, 317, 318, 333, 337, 357, 360W, 366
- BISC 410, 412, 414, 420, 421, 422, 425, 440W, 441, 455

Rationale. Course descriptions have been modified to meet the following criteria:

- *They are informative and provide details of the topics and skills covered in the course*. In some cases short descriptions have been expanded (e.g., BISC 410) to help students select courses by providing them with more information about course content.
- *They meet the 50 word limit*. Where descriptions exceeded the 50 word limit, they have been reduced to meet the limit. In some cases this required a major re-write of the course description (e.g., BISC 420).
- *They are accurate and current*. Course content is continuously changing to keep up with new disciplinary knowledge and ideas. Many descriptions were changed to better reflect current content. (E.g., The BISC 316 description was written 20+ years ago and described the course as it was taught at that time. The updated description describes current content, and uses modern terminology.)
- *They avoid details that may change between offerings or over the next few years*. Where possible, we have removed references to specific techniques, assignments, software or other details that are particular to an instructor or that may change over the next few years. (E.g., In BISC 421, the reference to Matlab was removed as alternative programs exist and may be used in the next few years.) We have left in specific techniques, software, or other details that are helpful to students and expected to remain accurate over the next few years. (E.g., In BISC 440W we left in the reference to R, as R is the primary analytic tool used by ecologists and evolutionary biologists.)
- *Reference to lab content.* Calendar descriptions have been updated so that all courses with labs now include a reference to the labs in the description. (Previously, descriptions did not consistently reference labs. For example, BISC 316 referenced a lab and BISC 306 did not, even though both courses include labs.) This is critical information as labs affect both what and how students learn. Additionally, our program majors are required to complete 5 upper division lab courses. The updates ensure that we're consistent on providing students with this critical information.
- *BISC 101 & 102 order.* BISC 101 & 102 now include an explicit statement noting that students can take these courses in either order. Although the pre-requisites already allow for this and this info is communicated elsewhere (e.g., website), new students still often assume the courses are sequential (like PHYS 101 & 102, MATH 154 & 155 etc). This student misconception causes problems with course enrolment management in the fall semester.

Course	**Description from:**	**Description to:**	**Merged from & to:**
BISC 100 Introduction to Biology	An introduction to the basic concepts of biology, emphasizing evolution as a unifying theme. ~~Topics~~ include cell structure, mitosis and	An introduction to the basic concepts of biology, emphasizing evolution as a unifying theme. **Lecture and lab topics** include cell structure,	An introduction to the basic concepts of biology, emphasizing evolution as a unifying theme. ~~Topics~~ **Lecture and lab topics** include cell

	meiosis, DNA structure and function, evolution and ~~population and ecosystem~~ ecology. [31 words]	mitosis and meiosis, DNA structure and function, evolution**,** and ecology. [31 words]	structure, mitosis and meiosis, DNA structure and function, evolution**,** and~~ population and ecosystem~~ ecology.
BISC 101 General Biology	~~An introduction~~ to the~~ biochemical and~~ physiological mechanisms of living organisms. ~~Topics covered~~ include cell structure and function, ~~DNA replication and the~~ flow of genetic information, enzyme function, metabolism ~~and physiology of microorganisms, plants, and animals.~~ [36 words]	**Introduction** to the **molecular, cellular and** physiological mechanisms of living organisms **(microorganisms, plants, animals)**. **Lecture and lab topics** include cell structure and function, flow of genetic information, enzyme function, metabolism**, whole organism form and function (circulation, gas exchange, nutrition, osmoregulation). BISC 101 & 102 can be taken in either order.** [50 words]	~~An introduction~~ **Introduction** to the ~~biochemical and~~ **molecular, cellular and** physiological mechanisms of living organisms **(microorganisms, plants, animals)**. ~~Topics covered~~ **Lecture and lab topics** include cell structure and function, ~~DNA replication and the~~ flow of genetic information, enzyme function, metabolism**, whole organism form and function (circulation, gas exchange, nutrition, osmoregularion)** ~~and physiology of microorganisms, plants, and animals.~~ **BISC 101 & 102 can be taken in either order.**
BISC 102 General Biology	~~Survey of the diversity of life, and its evolutionary history on earth. The student is introduced to the study of genetics, development, and evolution, giving an overview of how these processes interact to produce form and function. Also included are principles of behavior and ecological relationships of organisms to each other and their environment.~~ [54 words]	**Introduction to evolution and ecology, focusing on the processes that shape the diversity of life on earth. Lecture and lab topics include: natural selection and other mechanisms of evolutionary change, phylogeny, genetics, speciation, behaviour, species interactions, population ecology, and ecosystems. BISC 101 & 102 may be taken in either order. [50 words]**	~~Survey of the diversity of life, and its evolutionary history on earth. The student is introduced to the study of genetics, development, and evolution, giving an overview of how these processes interact to produce form and function. Also included are principles of behavior and ecological relationships of organisms to each other and their environment.~~ **Introduction to evolution and ecology, focusing on the processes that shape the diversity of life on earth. Lecture and lab topics include: natural selection and other mechanisms of evolutionary change, phylogeny, genetics, speciation, behaviour, species interactions, population ecology, and ecosystems. BISC 101 & 102 may be taken in either order.**

BISC 113 Biology in Everyday Life	Emphasizes the biology relevant to everyday life and the methods by which biologists address scientific questions. Topics ~~covered~~ include: evolution; human inheritance, reproduction, and development; nutrition, activity, wellness and cancer; agriculture and genetic engineering; and biodiversity and human affairs. [39 words]	Emphasizes the biology relevant to everyday life and the methods by which biologists address scientific questions. Topics include: evolution; human inheritance, reproduction, and development; nutrition, activity, wellness and cancer; agriculture and genetic engineering; and biodiversity and human affairs. [38 words]	Emphasizes the biology relevant to everyday life and the methods by which biologists address scientific questions. Topics ~~covered~~ include: evolution; human inheritance, reproduction, and development; nutrition, activity, wellness and cancer; agriculture and genetic engineering; and biodiversity and human affairs.
BISC 202 Genetics	~~Principles and concepts of the transmission of genetic information.~~ [9 words]	**Principles and concepts of transmission of genetic information. Topics include: molecular basis of inheritance, interpretation of pedigrees, chromosomal mapping, linkage, crosses, epigenetics, and the regulation and flow of genetic information from DNA to proteins. Focus on problem-solving. [37 words]**	~~Principles and concepts of the transmission of genetic information.~~ **Principles and concepts of transmission of genetic information. Topics include: molecular basis of inheritance, interpretation of pedigrees, chromosomal mapping, linkage, crosses, epigenetics, and the regulation and flow of genetic information from DNA to proteins. Focus on problem-solving.**
BISC 204 Ecology	~~An introduction to biotic environmental relationships and dynamics; ecological concepts; population dynamics, variation, adaptation and evolution.~~ [15 words]	**Introduces the different approaches used to study the natural world and explores ecological concepts and theory relating to animal behaviour, population dynamics, the distribution of species, structure of communities and the function of ecosystems. [34 words]**	~~An introduction to biotic environmental relationships and dynamics; ecological concepts; population dynamics, variation, adaptation and evolution.~~ **Introduces the different approaches used to study the natural world and explores ecological concepts and theory relating to animal behaviour, population dynamics, the distribution of species, structure of communities and the function of ecosystems.**
BISC 212	Students experience the practical challenges and creative joys of biological research. ~~Initially, students learn to think, research, and collaborate like scientists, while finding solutions to several "Real-World Problems". In subsequent weeks, students design, propose,~~	Students experience the practical challenges and creative joys of biological research**. In lectures and labs, students think, research, and collaborate like scientists by designing, conducting, and presenting students' own original research projects.** [32 words]	Students experience the practical challenges and creative joys of biological research. ~~Initially, students learn to think, research, and collaborate like scientists, while finding solutions to several "Real-World Problems". In subsequent weeks, students design, propose, conduct, and present~~

	~~conduct, and present their own original research projects, in teams~~. [44 words]		~~their own original research projects, in teams~~. **In lectures and labs, students think, research, and collaborate like scientists by designing, conducting, and presenting students' own original research projects.**
BISC 300 Evolution	The phenomenon of organic evolution, and the major ~~forces~~ leading to changes in allele frequencies over time, ~~i.e. natural selection and genetic drift.~~ Topics include ~~adaptation, speciation, the origin of life,~~ and the major evolutionary trends over geological time. [39 words]	The phenomenon of organic evolution, and the major **processes** leading to changes in allele frequencies over time, **namely mutation, migration, genetic drift and natural selection**. Topics include **evolutionary genetics, adaptation, sexual selection, the origin of life, speciation,** and the major evolutionary trends over geological time. [45 words]	The phenomenon of organic evolution, and the major ~~forces~~ **processes** leading to changes in allele frequencies over time, **namely mutation, migration, genetic drift and natural selection.** ~~i.e. natural selection and genetic drift.~~ Topics include **evolutionary genetics, adaptation, sexual selection, the origin of life, speciation,** ~~adaptation, speciation, the origin of life,~~ and the major evolutionary trends over geological time.
BISC 302W Genetic Analysis	~~Discussion and manipulations of some of the organisms and techniques applicable to genetic analysis. Students are required to come into the lab on average of two hours per week in addition to the four hour scheduled lab each week for project work.~~ [42 words]	**Students analyze different types of genetic data (e.g., genetic crosses, chromosome rearrangements, STR, RFLP) and use lab techniques (e.g., PCR, restriction digest, and gel electrophoresis) to solve case studies and genetics problems. [32 words]**	~~Discussion and manipulations of some of the organisms and techniques applicable to genetic analysis. Students are required to come into the lab on average of two hours per week in addition to the four hour scheduled lab each week for project work.~~ **Students analyze different types of genetic data (e.g., genetic crosses, chromosome rearrangements, STR, RFLP) and use lab techniques (e.g., PCR, restriction digest, and gel electrophoresis) to solve case studies and genetics problems.**
BISC 303 Microbiology	~~The biology of micro-organisms and their significance in the understanding of cellular processes. Students are required to come into the lab on average of two hours per week in addition to the four hour scheduled lab each week for project work.~~ [41 words]	**A broad introduction to micro-organisms (bacteria, viruses and archaea) with an emphasis on their molecular biology, metabolism, physiology, and interactions with their hosts and environment. Labs introduce**	~~The biology of micro-organisms and their significance in the understanding of cellular processes. Students are required to come into the lab on average of two hours per week in addition to the four hour scheduled lab each week for project work.~~ **A broad introduction to micro-**

		students to modern microbial techniques. [32 words]	**organisms (bacteria, viruses and archaea) with an emphasis on their molecular biology, metabolism, physiology, and interactions with their hosts and environment. Labs introduce students to modern microbial techniques.**
BISC 305 Animal Physiology	A study of major physiological systems, with an emphasis on understanding the ~~physics~~ underpinning physiological mechanisms. [16 words]	A study of **the** major physiological systems, with an emphasis on understanding the **biophysical properties** underpinning physiological mechanisms. [18 words]	A study of **the** major physiological systems, with an emphasis on understanding the ~~physics~~ **biophysical properties** underpinning physiological mechanisms.
BISC 306 Invertebrate Biology	An introduction to ~~selected invertebrate phyla with an emphasis on functional morphology, diversity and ecology.~~ [15 words]	An introduction to **invertebrate phyla, with a focus on marine taxa. Labs include examination of live animals, dissections, and preserved specimens. [21 words]**	An introduction to ~~selected invertebrate phyla with an emphasis on functional morphology, diversity and ecology.~~ **invertebrate phyla, with a focus on marine taxa. Labs include examination of live animals, dissections, and preserved specimens.**
BISC 313 Environmental Toxicology: A Mechanistic Perspective	~~Students are introduced to general principles of toxicological action, testing, evaluation and assessment. The environmental fate and toxic mechanisms of action of several important classes of environmental pollutants in several organisms (including humans) will be examined at different levels of organization, from the molecular and biochemical to the function of organ systems and behavior.~~ [54 words]	**An introduction to the environmental and biological fate of chemicals, their mechanisms of action, testing, evaluation, and risk assessment. Students are introduced to different classes of environmental contaminants, and examine how they affect various organisms (including humans) at the molecular, biochemical, organ system, and behavioural levels of biological organization. [49 words]**	~~Students are introduced to general principles of toxicological action, testing, evaluation and assessment. The environmental fate and toxic mechanisms of action of several important classes of environmental pollutants in several organisms (including humans) will be examined at different levels of organization, from the molecular and biochemical to the function of organ systems and behavior.~~ **An introduction to the environmental and biological fate of chemicals, their mechanisms of action, testing, evaluation, and risk assessment. Students are introduced to different classes of environmental contaminants, and examine how they affect various organisms (including humans) at the**

			molecular, biochemical, organ system, and behavioural levels of biological organization.
BISC 316 Vertebrate Biology	~~A review of the evolution and the taxonomy of the vertebrate classes. A comparative study of their organ systems and functions with particular reference to reproduction. A comparison of the functional morphology of some species by laboratory dissections.~~ [38 words]	**An overview of the evolution and diversity of vertebrates, with an emphasis on the evolutionary innovations and characteristics that led to this diversity. Labs explore comparative anatomy through dissections, bones, and other specimens. [33 words]**	~~A review of the evolution and the taxonomy of the vertebrate classes. A comparative study of their organ systems and functions with particular reference to reproduction. A comparison of the functional morphology of some species by laboratory dissections.~~ **An overview of the evolution and diversity of vertebrates, with an emphasis on the evolutionary innovations and characteristics that led to this diversity. Labs explore comparative anatomy through dissections, bones, and other specimens.**
BISC 317 Insect Biology	~~Life histories, bionomics, comparative morphology, and classification of insects and related organisms. A collection may be required, depending on instructor.~~ [20 words]	**An introduction to insect classification, body plan, post-embryonic development, and systems: circulatory, ventilatory, digestive, and sensory. Labs focus on comparative morphology, collection, identification, and preservation of specimens. [27 words]**	~~Life histories, bionomics, comparative morphology, and classification of insects and related organisms. A collection may be required, depending on instructor.~~ **An introduction to insect classification, body plan, post-embryonic development, and systems: circulatory, ventilatory, digestive, and sensory. Labs focus on comparative morphology, collection, identification, and preservation of specimens.**
BISC 318 Parasitology	Ecology and phylogeny of animal parasites (from protozoa to helminthes), including those of humans, domestic animals and wildlife. ~~Parasite~~ success, host-parasite interactions, ~~general epidemiological~~ principles of parasitic infections~~, and reproductive strategies used by parasites to increase the likelihood of transmission as well as~~ host responses and	Ecology**, morphology,** and phylogeny of animal parasites (from protozoa to helminthes), including those of humans, domestic animals**,** and wildlife. **Lecture and lab topics include: parasite** success, host-parasite interactions, principles of parasitic infections, **parasite reproduction and transmission,** host responses**,** and medical options for past and current parasite problems. [47 words]	Ecology**, morphology**, and phylogeny of animal parasites (from protozoa to helminthes), including those of humans, domestic animals**,** and wildlife. ~~Parasite~~ **Lecture and lab topics include: parasite** success, host-parasite interactions, ~~general epidemiological~~ principles of parasitic infections, ~~and reproductive strategies used by parasites to increase the likelihood of transmission as well~~ **parasite reproduction and transmission,** as host

	medical options for past and current parasite problems. [54 words]		responses and medical options for past and current parasite problems.
BISC 327	~~A~~ survey of the major groups of algae, including cyanobacteria and other microscopic algae, seaweeds and freshwater algae. Addresses aspects of evolution, taxonomy, ecology, anatomy, life history, and the importance of algae in our lives~~. The course includes labs and a weekend field trip to the Bamfield Marine Sciences Centre.~~ [50 words]	**Lectures and labs provide a** survey of the major groups of algae, including cyanobacteria and other microscopic algae, seaweeds and freshwater algae. Addresses aspects of evolution, taxonomy, ecology, anatomy, life history, and the importance of algae in our lives. [39 words]	~~A~~ **Lectures and labs provide a** survey of the major groups of algae, including cyanobacteria and other microscopic algae, seaweeds and freshwater algae. Addresses aspects of evolution, taxonomy, ecology, anatomy, life history, and the importance of algae in our lives. ~~The course includes labs and a weekend field trip to the Bamfield Marine Sciences Centre.~~
BISC 328	~~An~~ overview of the fungi including their identification and ecological roles, with emphasis on molds and mushrooms. Topics include: identification using morphological and molecular techniques, roles in natural and agricultural ecosystems, and the uses and detrimental effects of fungi in food production and medicine. ~~Lab course.~~ [46 words]	**Lectures and labs provide an** overview of the fungi including their identification and ecological roles, with emphasis on molds and mushrooms. Topics include: identification using morphological and molecular techniques, roles in natural and agricultural ecosystems, and the uses and detrimental effects of fungi in food production and medicine. [48 words]	~~An~~ **Lectures and labs provide an** overview of the fungi including their identification and ecological roles, with emphasis on molds and mushrooms. Topics include: identification using morphological and molecular techniques, roles in natural and agricultural ecosystems, and the uses and detrimental effects of fungi in food production and medicine. ~~Lab course.~~
BISC 333 Developmental Biology	~~Classical and modern experimental approaches will be described for understanding development of embryos of several species having common and distinctive features. These approaches are at the organismal, cellular, molecular and genetic levels.~~ [32 words]	**Embryonic and post-embryonic development of vertebrates, invertebrates, and plants, with a focus on both classical and modern experimental approaches. Common and distinct features of the genes and signalling pathways that control development will be compared at the organismal, cellular, molecular and genetic levels. [43 words]**	~~Classical and modern experimental approaches will be described for understanding development of embryos of several species having common and distinctive features. These approaches are at the organismal, cellular, molecular and genetic levels.~~**Embryonic and post-embryonic development of vertebrates, invertebrates, and plants, with a focus on both classical and modern experimental approaches. Common and distinct features of the genes and signalling pathways that control development**

			will be compared at the organismal, cellular, molecular and genetic levels.
BISC 337 Plant Biology	~~An introductory course covering many aspects of plant biology including the origin and evolution of plants, basic anatomy, plant growth and development and the utilization and impact of plants in human society.~~ [32 words]	A survey and comparison of the major plant groups including their origins, evolution, anatomy, life histories, and impacts on human society. Labs emphasize microscopy and observation of plant specimens. [29 words]	~~An introductory course covering many aspects of plant biology including the origin and evolution of plants, basic anatomy, plant growth and development and the utilization and impact of plants in human society.~~ **A survey and comparison of the major plant groups including their origins, evolution, anatomy, life histories, and impacts on human society. Labs emphasize microscopy and observation of plant specimens.**
BISC 357 Genetic Engineering	~~Techniques in gene cloning and the evaluation of gene function are introduced in lectures and practiced in labs. Lab exercises include genomic DNA, RNA, and plasmid purification; PCR; various cloning techniques; and construction of novel genes. Students are introduced to additional techniques in lectures including gene editing, and genome sequencing.~~ [50 words]	**The use of genetic engineering to evaluate and alter gene function is introduced in lectures and practiced in labs. Lectures cover bioinformatics, gene editing, and genome sequencing. Lab projects include a series of cloning techniques from nucleic acid extraction to making novel gene constructs. [44 words]**	~~Techniques in gene cloning and the evaluation of gene function are introduced in lectures and practiced in labs. Lab exercises include genomic DNA, RNA, and plasmid purification; PCR; various cloning techniques; and construction of novel genes. Students are introduced to additional techniques in lectures including gene editing, and genome sequencing.~~ **The use of genetic engineering to evaluate and alter gene function is introduced in lectures and practiced in labs. Lectures cover bioinformatics, gene editing, and genome sequencing. Lab projects include a series of cloning techniques from nucleic acid extraction to making novel gene constructs.**
BISC 360W Techniques in Ecology & Evolution	A practical lab- and field-based introduction to techniques in ecology and evolution. Students ~~will collect, analyze, and interpret data, using appropriate experimental design and statistical methods.~~ Specific topics include: sampling and describing communities, evaluating spatial	A practical lab- and field-based introduction to techniques in ecology and evolution. Students **use experimental design and statistical methods to collect, analyze, and interpret data.** Specific topics **may** include: sampling and describing communities, evaluating spatial	A practical lab- and field-based introduction to techniques in ecology and evolution. Students ~~will collect, analyze, and interpret data, using appropriate experimental design and statistical methods.~~ **use experimental design and statistical methods to collect, analyze, and interpret data**. Specific topics **may** include:

	patterns, investigating animal behaviour, population estimation, estimating competition~~, and phylogenetic inference.~~ [46 words]	patterns, investigating animal behaviour, population estimation, **and** estimating competition. [44 words]	sampling and describing communities, evaluating spatial patterns, investigating animal behaviour, population estimation, **and** estimating competition~~, and phylogenetic inference~~.
BISC 366 Plant Physiology	~~The plant's physical environment and the physiological basis (mechanisms and principles) of the interaction between plants and their environment in relation to their survival and ecological distribution.~~ [27 words]	**The physiological and developmental mechanisms underlying the growth and survival of plants in their environments, including traits of key importance in plant production. [23 words]**	~~The plant's physical environment and the physiological basis (mechanisms and principles) of the interaction between plants and their environment in relation to their survival and ecological distribution.~~ **The physiological and developmental mechanisms underlying the growth and survival of plants in their environments, including traits of key importance in plant production.**
BISC 410 Behavioral Ecology	~~An introduction to the evolution of behavior and its adaptiveness in a natural context.~~ [14 words]	**Behavioural ecologists study the evolutionary causes and ecological consequences of behaviour. This course explores theories developed to explain group-living, foraging decisions, signalling, mate choice and reproductive strategies, and provides an opportunity to develop novel hypotheses for (and design experiments to test) why animals, including humans, behave the way they do. [50 words]**	~~An introduction to the evolution of behavior and its adaptiveness in a natural context.~~ **Behavioural ecologists study the evolutionary causes and ecological consequences of behaviour. This course explores theories developed to explain group-living, foraging decisions, signalling, mate choice and reproductive strategies, and provides an opportunity to develop novel hypotheses for (and design experiments to test) why animals, including humans, behave the way they do.**
BISC 412 Aquatic Ecology	The scientific study of marine and freshwater ecosystems. Through ~~a combination of~~ lecture and field/lab components, the course will examine a combination of fundamental concepts of aquatic ecology as well as challenges posed to these ecosystems by environmental change. Students will gain hands-	The scientific study of marine and freshwater ecosystems. Through lecture and field/lab components, the course will examine a combination of fundamental concepts of aquatic ecology as well as challenges posed to these ecosystems by environmental change. Students will gain hands-on experience with	The scientific study of marine and freshwater ecosystems. Through ~~a combination of~~ lecture and field/lab components, the course will examine a combination of fundamental concepts of aquatic ecology as well as challenges posed to these ecosystems by environmental change. Students will gain hands-on experience with data collection, analysis, and communication.

	on experience with data collection, analysis, and communication. [50 words]	data collection, analysis, and communication. **[47 words]**	
BISC 414 Limnology	An integrated examination of biological, chemical and physical processes in lakes and running water ecosystems. Interactions among biological, chemical and physical controls on the structure, function and dynamics of aquatic ecosystems ~~are emphasized~~. Environmental problems resulting from human disturbances to aquatic ecosystems are examined. [44 words]	An integrated examination of biological, chemical and physical processes in lakes and running water ecosystems. **Lectures and labs emphasize** Interactions among biological, chemical**,** and physical controls on the structure, function**,** and dynamics of aquatic ecosystems. Environmental problems resulting from human disturbances to aquatic ecosystems are examined. [46 words]	An integrated examination of biological, chemical and physical processes in lakes and running water ecosystems. **Lectures and labs emphasize** Interactions among biological, chemical**,** and physical controls on the structure, function**,** and dynamics of aquatic ecosystems ~~are emphasized~~. Environmental problems resulting from human disturbances to aquatic ecosystems are examined.
BISC 420 Community Ecology	~~This course will examine the importance of species interactions that occur in ecological communities and the role of biotic and abiotic, natural and anthropogenic processes that underpin large-scale patterns of biodiversity. The course will provide a strong conceptual framework in community ecology with a focus on hypothesis development, alternative methodological approaches, the interpretation of data, and the synthesis of information across studies.~~ [62 words]	**Community ecologists study large-scale patterns in biodiversity and the processes that influence the structure and function of communities. This course introduces concepts and theories central to community ecology, with a focus on observations, hypotheses, experiments and quantitative models, and explores applications of community ecology to emerging problems in human-dominated ecosystems. [50 words]**	~~This course will examine the importance of species interactions that occur in ecological communities and the role of biotic and abiotic, natural and anthropogenic processes that underpin large-scale patterns of biodiversity. The course will provide a strong conceptual framework in community ecology with a focus on hypothesis development, alternative methodological approaches, the interpretation of data, and the synthesis of information across studies.~~ **Community ecologists study large-scale patterns in biodiversity and the processes that influence the structure and function of communities. This course introduces concepts and theories central to community ecology, with a focus on observations, hypotheses, experiments and quantitative models, and explores applications of community ecology to emerging problems in human-dominated ecosystems.**

BISC 421 Models in Biology: From Molecules to Migration	Students are introduced to models and simulations for biological systems at the ecosystem, organismal, cellular, and molecular levels. They will discover how to design and use models, and will then apply these skills to build their own model using basic mathematical tools~~, Excel, and Matlab~~. [45 words]	Students are introduced to models and simulations for biological systems at the ecosystem, organismal, cellular, and molecular levels. They will discover how to design and use models, and will then apply these skills to build their own model using basic mathematical tools **(e.g., Excel, other software)**. [46 words]	Students are introduced to models and simulations for biological systems at the ecosystem, organismal, cellular, and molecular levels. They will discover how to design and use models, and will then apply these skills to build their own model using basic mathematical tools~~, Excel, and Matlab.~~ **(e.g., Excel, other software).**
BISC 422 Population Genetics	~~Theoretical and experimental aspects of inheritance at the population level. Topics include Hardy-Weinberg, one- and two-locus selection theory, introduction to quantitative genetics, and Fisher's fundamental theorem of natural selection.~~ [29 words]	**The heritable genetic basis for biological variation among populations. Concepts emphasize models (from theory), estimators (using data), and assumptions (via simulation). Topics focus on the Big Five: mutation, recombination, genetic drift, gene flow, and natural selection. [36 words]**	~~Theoretical and experimental aspects of inheritance at the population level. Topics include Hardy-Weinberg, one- and two-locus selection theory, introduction to quantitative genetics, and Fisher's fundamental theorem of natural selection.~~**The heritable genetic basis for biological variation among populations. Concepts emphasize models (from theory), estimators (using data), and assumptions (via simulation). Topics focus on the Big Five: mutation, recombination, genetic drift, gene flow, and natural selection.**
BISC 425 Sensory Biology	This course ~~will examine~~ the basic physiological mechanisms underlying various senses including vision, audition, olfaction, gustation, ~~and~~ touch~~. Non-mamalian senses like~~ polarization sensitivity and mechanoreception ~~will also be explored.~~ Lectures ~~will~~ combine concepts from physics, systems neuroscience, cell and molecular biology, and behaviour. ~~The aim is to present an overview of the major sensory mechanisms underlying animal behaviour.~~ [58 words]	**An overview of the major sensory mechanisms underlying animal behaviour.** This course **examines** the basic physiological mechanisms underlying various **mammalian and non-mammalian** senses including vision, audition, olfaction, gustation, touch**,** polarization sensitivity**,** and mechanoreception. Lectures combine concepts from physics, systems neuroscience, cell and molecular biology, and behaviour. [46 words]	**An overview of the major sensory mechanisms underlying animal behaviour.** This course ~~will examine~~ **examines** the basic physiological mechanisms underlying various **mammalian and non-mammalian** senses including vision, audition, olfaction, gustation, ~~and touch. Non-mamalian senses like~~ polarization sensitivity and mechanoreception ~~will also be explored~~. Lectures ~~will~~ combine concepts from physics, systems neuroscience, cell and molecular biology, and behaviour. ~~The aim is to present~~

			~~an overview of the major sensory mechanisms underlying animal behaviour.~~
BISC 440W Biodiversity	~~The production and organization of biodiversity (investigations of species, and an in-depth look at taxonomy, systematics and phylogenetics). Evolutionary and ecological theories behind the patterns of biodiversity (the current and future geographic distribution of species, and how biodiversity is related to ecosystem function). The values society gives biodiversity (how our values are reflected in law and regulation).~~ [57 words]	**Considers the production and organization of biodiversity, the evolutionary and ecological theories behind temporal and spatial patterns of biodiversity, and the values society gives biodiversity. Computer labs introduce students to phylogenetic and comparative analyses using the program R. [38 words]**	~~The production and organization of biodiversity (investigations of species, and an in-depth look at taxonomy, systematics and phylogenetics). Evolutionary and ecological theories behind the patterns of biodiversity (the current and future geographic distribution of species, and how biodiversity is related to ecosystem function). The values society gives biodiversity (how our values are reflected in law and regulation).~~ **Considers the production and organization of biodiversity, the evolutionary and ecological theories behind temporal and spatial patterns of biodiversity, and the values society gives biodiversity. Computer labs introduce students to phylogenetic and comparative analyses using the program R.**
BISC 441 Evolution of Health and Disease	Application of the principles and theories of evolution and ecology to ~~the study of~~ health and disease, with ~~a particular but not exclusive~~ emphasis on humans. Topics ~~to be covered~~ include ~~the~~ evolutionary ecology of infectious disease, the immune system, cancer, senescence, fetal programming, and the genetic/environmental bases of disease. ~~The course will involve a combination of lectures by the primary faculty member teaching the course, discussions, student research projects (papers, written and revised, and presentations~~	Application of the principles and theories of evolution and ecology to **understanding** health and disease, with **an** emphasis on humans. Topics include**:** evolutionary ecology of infectious disease, immune system, cancer, senescence, fetal programming, and the genetic/environmental bases of disease. [39 words]	Application of the principles and theories of evolution and ecology to **understanding** the study of health and disease, with ~~a particular but not exclusive~~ **an** emphasis on humans. Topics to be covered include the evolutionary ecology of infectious disease, the immune system, cancer, senescence, fetal programming, and the genetic/environmental bases of disease. ~~The course will involve a combination of lectures by the primary faculty member teaching the course, discussions, student research projects (papers, written and revised,~~

	~~to the class), and specialist guest lectures.~~ [83 words]		~~and presentations to the class), and specialist guest lectures.~~
BISC 455 Endocrinology	~~A study of endocrine organs and their role in integrating physiological functions in animals.~~ [14 words]	**Physiological function of neuroendocrine and hormonal systems in invertebrates and vertebrates (and a little bit on plants). The course examines endocrinology from the molecular to whole-organismal level, with a focus on reproduction, obesity, and stress. [35 words]**	~~A study of endocrine organs and their role in integrating physiological functions in animals.~~ **Physiological function of neuroendocrine and hormonal systems in invertebrates and vertebrates (and a little bit on plants). The course examines endocrinology from the molecular to whole-organismal level, with a focus on reproduction, obesity, and stress.**

(Last updated Nov 10, 2022)

Motion 3: To update BISC pre-requisites for the following courses:

- BISC 100, 101, 102, 113
- BISC 202, 204, 212
- BISC 300, 302W, 303, 305, 306, 308, 309, 313, 316, 317, 318, 327, 328, 333, 337, 357, 360W, 366, 373
- BISC 403, 405, 407, 410, 412, 413, 414, 420, 421, 422, 423, 424, 425, 428, 430, 440W, 441, 445, 455, 457

Rationale. Course pre-requisites have been modified to meet the following criteria:

- Formatting and syntax of pre-requisites are standardized across courses.
    - Minimize redundancy by listing the minimum courses that ensure students have met requirements. For example, if 101, 102, and 204 are required, only 204 needs to be listed because 101 & 102 are pre-reqs of 204.
        - E.g., BISC 204 with a minimum grade of C-.
    - In cases where non-BISC alternatives are listed (or where students may receive transfer credit for 200 level BISC courses but not their 100 level pre-reqs), it may be necessary to specify lower pre-reqs (e.g., BISC 204 requires BISC 101 & 102, but GEOG 215 does not).
        - E.g., BISC 101, 102, and (BISC 204 or GEOG 215), all with a minimum grade of C-.
    - As recommended by Kris Nordgren, alternatives are listed in brackets, and punctuation is standardized.
        - E.g., BISC 101, 102, and (BISC 204 or HSCI 212), all with a minimum grade of C-.
- Pre-requisites minimize barriers to course, while ensuring students have necessary background to succeed.
- Pre-requisites are comparable across similar courses (e.g., all organismal lab courses).

Motion 4: To update BISC equivalent statements for the following courses:

- BISC 100, 113
- BISC 212
- BISC 300, 302W, 308, 309, 318, 360W, 373
- BISC 403, 405, 412, 413, 420, 421, 423, 424, 425, 440W

Rationale. Equivalent statements were removed where they were no longer needed.

Course	**Pre-reqs & equivalent from:**	**Pre-reqs to:**	**Equivalent Statement to:**	**Merged pre-req & equivalent, from & to:**
BISC 100 Introduction to Biology	Students with a C ~~or better~~ in Biology 12~~,~~ who are considering a BISC Major, are encouraged to proceed directly to BISC 101 and 102. Students with credit for BISC 101, 102 or 113, or succeeding biology courses, may not take BISC 100 for further credit.	Students with a **minimum grade of** C in Biology 12 **(or equivalent)** who are considering a BISC Major, are encouraged to proceed directly to BISC 101 and 102.		Students with a **minimum grade of** C ~~or better~~ in Biology 12~~,~~ **(or equivalent)** who are considering a BISC Major, are encouraged to proceed directly to BISC 101 and 102. Students with credit for BISC 101, 102 or 113, or succeeding biology courses, may not take BISC 100 for further credit.
BISC 101 General Biology	~~High school~~ Biology 12 (or equivalent) with a C ~~grade or better,~~ or BISC 100 with C- ~~or better~~, or BISC 113 with C+ ~~or better~~, or HSCI 100 with C+ ~~or better~~; and ~~High school~~ Chemistry 12 (or equivalent) with a C ~~grade or better,~~ or CHEM 111 with a C- ~~or better~~.	Biology 12 (or equivalent) with a **minimum grade of** C **(**or BISC 100 with **a minimum grade of** C-, or BISC 113 with **a minimum grade of** C+, **or BPK 105 with a minimum grade of C+,** or HSCI 100 with **a minimum grade of** C+**)**, and Chemistry 12 (or equivalent) with a **minimum grade of** C **(**or CHEM 111 with a **minimum grade of** C-**)**.		~~High school~~ Biology 12 (or equivalent) with a **minimum grade of** C ~~grade or better,~~ **(**or BISC 100 with **a minimum grade of** C- ~~or better~~, or BISC 113 with **a minimum grade of** C+ ~~or better~~, **or BPK 105 with a minimum grade of C+,** or HSCI 100 with **a minimum grade of** C+**)** ~~or better~~; and ~~High school~~ Chemistry 12 (or equivalent) with a **minimum grade of** C ~~grade or better~~, **(**or CHEM 111 with a **minimum grade of** C-**)** ~~or better~~.
BISC 102 General Biology	~~High school b~~iology 12 (or equivalent) with a C ~~grade or better,~~ or BISC 100 with C- ~~or better~~, or BISC 113 with C+ ~~or better~~, or HSCI 100 with C+ ~~or better~~.	**B**iology 12 (or equivalent) with a **minimum grade of** C **(**or BISC 100 with **a minimum grade of** C-, or BISC 113 with **a minimum grade of** C+, **or BPK 105 with a minimum**		~~High school~~ **B**iology 12 (or equivalent) with a **minimum grade of** C ~~grade or better~~, **(**or BISC 100 with **a minimum grade of** C- ~~or better~~, or BISC 113 with **a minimum grade of** C+ ~~or better~~, **or BPK 105 with a minimum grade of C+,**

		grade of C+, or HSCI 100 with **a minimum grade of** C+**)**.		or HSCI 100 with **a minimum grade of** C+**)** ~~or better~~.
BISC 113 Biology in Everyday Life	~~Recommended:~~ Students with a C ~~or better~~ in Biology 12~~,~~ who are considering a BISC ~~m~~ajor, are encouraged to proceed directly to BISC 101 and 102. Students with credit for HSCI 100, BISC 101, 102, or succeeding ~~Biology~~ courses, may not take BISC 113 for further credit.	Students with a **minimum grade of** C in Biology 12 **(or equivalent)** who are considering a BISC **M**ajor, are encouraged to proceed directly to BISC 101 and 102.	Students with credit for HSCI 100, **BISC 100,** BISC 101, 102, or succeeding **BISC** courses, may not take BISC 113 for further credit.	~~Recommended~~: Students with a **minimum grade of** C ~~or better~~ in Biology 12 **(or equivalent)** who are considering a BISC ~~major~~ **Major**, are encouraged to proceed directly to BISC 101 and 102. Students with credit for HSCI 100, BISC **100,** 101, 102, or succeeding ~~Biology~~ **BISC** courses, may not take BISC 113 for further credit.
BISC 202 Genetics	BISC 101 and 102 with a grade of C- ~~or better~~.	BISC 101 and 102**, both** with a **minimum** grade of C-.		BISC 101 and 102**, both** with a **minimum** grade of C- ~~or better.~~
BISC 204 Ecology	BISC 101 and 102 with a grade of C- ~~or better~~.	BISC 101 and 102**, both** with a **minimum** grade of C-.		BISC 101 and 102**, both** with a **minimum** grade of C- ~~or better.~~
BISC 212	~~Any two of the following courses: BISC 101, BISC 102, BPK 142, CHEM 121, CHEM 126, EASC 101, PHYS 132, PHYS 133, PHYS 140, and PHYS 141, with a grade of C- or better. Completion of less than 60 units is preferred. Course entry is by application and approval by the instructor.~~	**BISC 101 and 102, both with a minimum grade of C-, and completion of less than 60 units; or permission of the instructor.**	[equivalent statement removed]	~~Any two of the following courses: BISC 101, BISC 102, BPK 142, CHEM 121, CHEM 126, EASC 101, PHYS 132, PHYS 133, PHYS 140, and PHYS 141, with a grade of C- or better. Completion of less than 60 units is preferred. Course entry is by application and approval by the instructor. Students with credit for BISC 272 - Special Topics: Biological Research~~

	~~Students with credit for BISC 272 – Special Topics: Biological Research may not take this course for further credit.~~			~~may not take this course for further credit.~~ **BISC 101 and 102, both with a minimum grade of C-, and completion of less than 60 units; or permission of the instructor.**
BISC 300 Evolution	BISC 202 with a grade of C- ~~or better~~. Recommended: BISC 204. ~~Students with credit for BISC 400 may not take this course for further credit.~~	BISC 202 with a **minimum** grade of C-. Recommended: BISC 204.	[equivalent statement removed]	BISC 202 with a **minimum** grade of C- ~~or better~~. Recommended: BISC 204. ~~Students with credit for BISC 400 may not take this course for further credit.~~
BISC 302W Genetic Analysis	BISC 202 with a grade of C- ~~or better~~. ~~Students with credit for BISC 302 may not take this course for further credit.~~	BISC 202 **and MBB 222, both** with a **minimum** grade of C-. Writing	[equivalent statement removed]	BISC 202 **and MBB 222, both** with a **minimum** grade of C- ~~or better~~. ~~Students with credit for BISC 302 may not take this course for further credit.~~
BISC 303 Microbiology	BISC 102 and MBB 231 with a grade of C- ~~or better~~.	BISC 102**, MBB 222,** and MBB 231**, all** with a **minimum** grade of C-.		BISC 102**, MBB 222,** and MBB 231**, all** with a **minimum** grade of C- ~~or better~~.
BISC 305 Animal Physiology	BISC 205 ~~(~~or BPK 205) and MBB 231 with a grade of C- ~~or better~~.	**(**BISC 205 or BPK 205) and MBB 231**, both** with a **minimum** grade of C-.		**(**BISC 205 ~~(~~or BPK 205) and MBB 231**, both** with a **minimum** grade of C- ~~or better~~.
BISC 306 Invertebrate Biology	BISC 101, 102 and 204 with a grade of C- ~~or better~~.	BISC 101, 102**,** and **(BISC** 204 **or GEOG 215), all** with a **minimum** grade of C-.		BISC 101, 102**,** and **(BISC** 204 **or GEOG 215), all** with a **minimum** grade of C- ~~or better~~.

BISC 308 Environmental Toxicology: An Ecological Perspective	BISC 101, ~~BISC~~ 102, and ~~either~~ BISC 204 or GEOG 215, all with C- ~~or better~~. ~~Students who have taken BISC 312, or special topics course BISC 473 with the title "Introduction to Environmental Toxicology", may not take this course for further credit.~~	BISC 101, 102, and **(**BISC 204 or GEOG 215**)**, all with **a minimum grade of** C-.	[equivalent statement removed]	BISC 101, ~~BISC~~ 102, and ~~either~~ **(**BISC 204 or GEOG 215**)**, all with **a minimum grade of** C- ~~or better~~. ~~Students who have taken BISC 312, or special topics course BISC 473 with the title "Introduction to Environmental Toxicology", may not take this course for further credit.~~
BISC 309 Conservation Biology	BISC 204 with a grade of C- ~~or better~~. ~~Students who have taken BISC 474 in Spring 2006 or BISC 475 in Spring 2008 as special topics courses titled 'Conservation Ecology' cannot take this course for further credit.~~	BISC 204 with a **minimum** grade of C-.	[equivalent statement removed]	BISC 204 with a **minimum** grade of C- ~~or better~~. ~~Students who have taken BISC 474 in Spring 2006 or BISC 475 in Spring 2008 as special topics courses titled 'Conservation Ecology' cannot take this course for further credit.~~
BISC 313 Environmental Toxicology: A Mechanistic Perspective	BISC 101 and ~~one of~~ BISC 204, GEOG 215, or MBB 231~~; all~~ with a grade of C- ~~or better~~.	BISC 101 and **(**BISC 204, **or BISC 205**, **or** GEOG 215, or MBB 231**), both** with a **minimum** grade of C-.		BISC 101 and ~~one of~~ **(**BISC 204, **or BISC 205, or** GEOG 215, or MBB 231**)**~~; all~~**, both** with a **minimum** grade of C- ~~or better.~~
BISC 316	BISC 101 and 102 with a grade of C- ~~or better~~.	BISC 101 and 102**, both** with a **minimum** grade of C-.		BISC 101 and 102**, both** with a **minimum** grade of C- ~~or better~~.

Vertebrate Biology				
BISC 317 Insect Biology	BISC 101 and 102 with a grade of C- ~~or better~~.	BISC 101 and 102**, both** with a **minimum** grade of C-.		BISC 101 and 102**, both** with a **minimum** grade of C- ~~or better~~.
BISC 318 Parasitology	BISC 101 ~~and~~ 102, and 204 or HSCI 212 with a grade of C- ~~or better and completion of 60 units. Recommended: BISC 300 and 306.~~ ~~Students who have taken BISC 418 Parasitology may not take this course for further credit.~~	BISC 101**,** 102, and **(BISC** 204 or HSCI 212**), all** with a **minimum** grade of C-.	[equivalent statement removed]	BISC 101**,** ~~and~~ 102, and **(BISC** 204 or HSCI 212**), all** with a **minimum** grade of C- ~~or better and completion of 60 units. Recommended: BISC 300 and 306~~. ~~Students who have taken BISC 418 Parasitology may not take this course for further credit.~~
BISC 327 Algal Biology	BISC 101 and 102, both with a grade of C- ~~or better~~. Students who have taken BISC 326 first may not then take this course for further credit.	BISC 101 and 102, both with a **minimum** grade of C-.		BISC 101 and 102, both with a **minimum** grade of C- ~~or better~~. Students who have taken BISC 326 first may not then take this course for further credit.
BISC 328 Fungal Biology and Ecology	BISC 101 and 102, both with a grade of C- ~~or better~~. Recommended: BISC 204. Students who have taken BISC 326 first may not then take this course for further credit.	BISC 101 and 102, both with a **minimum** grade of C-. Recommended: BISC 204.		BISC 101 and 102, both with a **minimum** grade of C- ~~or better~~. Recommended: BISC 204. Students who have taken BISC 326 first may not then take this course for further credit.

BISC 333 Developmental Biology	BISC 202, MBB 222, MBB 231 with a grade of C- ~~or better~~.	BISC 202, MBB 222, **and** MBB 231**,** **all** with a **minimum** grade of C-.		BISC 202, MBB 222, **and** MBB 231**,** **all** with a **minimum** grade of C- ~~or better~~.
BISC 337 Plant Biology	BISC 101 and 102 with a grade of C- ~~or better~~.	BISC 101 and 102**, both** with a **minimum** grade of C-.		BISC 101 and 102**, both** with a **minimum** grade of C- ~~or better~~.
BISC 357 Genetic Engineering	BISC 202, MBB 222, and MBB 231, all with a grade of C- ~~or better~~. Recommended: MBB 331. Students with credit for MBB 308 may not take this course for further credit.	BISC 202, MBB 222, and MBB 231, all with a **minimum** grade of C-. Recommended: MBB 331.	Students with credit for MBB 308 may not take this course for further credit.	BISC 202, MBB 222, and MBB 231, all with a **minimum** grade of C- ~~or better~~. Recommended: MBB 331. Students with credit for MBB 308 may not take this course for further credit.
BISC 360W Techniques in Ecology & Evolution	BISC 202, BISC 204 ~~(~~or GEOG 215), and STAT 201, all with C- ~~or better~~. ~~Students who have taken BISC 404 Plant Ecology may not take BISC 360 for further credit.~~	BISC 202, **(**BISC 204 or GEOG 215), and STAT 201, all with **a minimum grade of** C-. Writing.	[equivalent statement removed]	BISC 202, **(**BISC 204 ~~(~~or GEOG 215), and STAT 201, all with **a minimum grade of** C- ~~or better~~. ~~Students who have taken BISC 404 Plant Ecology may not take BISC 360 for further credit.~~
BISC 366 Plant Physiology	BISC 205 and MBB 231 with a grade of C- ~~or better~~.	BISC 205 and MBB 231**, both** with a **minimum** grade of C-.		BISC 205 and MBB 231**, both** with a **minimum** grade of C- ~~or better~~.
BISC 373 Brewing Science	60 units. ~~Students with credit for BISC 374 may not take this course for further credit. Students who have~~	60 units.	Students may not count this course toward their Biological Science Honours, Majors, or Minor requirements.	60 units. ~~Students with credit for BISC 374 may not take this course for further credit. Students who have completed BISC~~

	~~completed BISC 372 ST Brewing Science may not take BISC 373 for further credit.~~ Students may not count this course toward their Biological Science Honours, Majors, or Minor requirements.			~~372 ST Brewing Science may not take BISC 373 for further credit.~~ Students may not count this course toward their Biological Science Honours, Majors, or Minor requirements.
BISC 403 Current Topics in Cell Biology	MBB 222~~,~~ 231~~-~~with C- ~~or better,~~ and~~-completion of~~ 75 units~~, or completion of BISC 305 or 366 with a C- or better.~~ ~~Students with credit for BISC 372 under this topic may not take this course for further credit.~~	MBB 222 **and** 231**, both** with **a minimum grade of C-;** and **at least** 75 units **(or permission of the instructor). Recommended: BISC 205 or BPK 205.**	[equivalent statement removed]	MBB 222~~,~~ **and** 231**, both** with **a minimum grad of** C- ~~or better,~~; and **at least** ~~completion of~~ 75 units~~, or completion of BISC 305 or 366 with a C- or better.~~ **(or permission of the instructor). Recommended: BISC 205 or BPK 205.** ~~Students with credit for BISC 372 under this topic may not take this course for further credit.~~
BISC 405 Neurobiology	BISC 205 or BPK 205 and MBB 231 with a grade of C- ~~or better~~. ~~Students who have completed BISC 472 under the title 'Neurobiology' may not complete BISC 405 for further credit.~~	**(**BISC 205 or BPK 205**)** and MBB 231**, both** with a **minimum** grade of C-.	[equivalent statement removed]	**(**BISC 205 or BPK 205**)** and MBB 231**,** **both** with a **minimum** grade of C- ~~or better~~. ~~Students who have completed BISC 472 under the title 'Neurobiology' may not complete BISC 405 for further credit.~~

BISC 407 Population Dynamics	BISC 102 ~~and either~~ BISC 204 or GEOG 215, all with a grade of C- ~~or better~~.	BISC 102**, (**BISC 204 or GEOG 215**), and MATH 154,** all with a **minimum** grade of C-.		BISC 102**,** ~~and either~~ **(**BISC 204 or GEOG 215**)**, **and MATH 154,** all with a **minimum** grade of C- ~~or better~~.
BISC 410 Behavioral Ecology	BISC 102 and ~~either~~ BISC 204 or GEOG 215, ~~all~~ with a grade of C- ~~or better~~.	BISC 102 and **(**BISC 204 or GEOG 215**)**, **both** with a **minimum** grade of C-.		BISC 102 and ~~either~~ **(**BISC 204 or GEOG 215**)**, ~~all~~ **both** with a **minimum** grade of C- ~~or better~~.
BISC 412 Aquatic Ecology	BISC 101, ~~BISC~~ 102, and ~~either~~ BISC 204 or GEOG 215~~;~~ all with a grade of C- ~~or better~~. ~~Students who have completed Special Topics BISC 473 Aquatic Ecology may not take this course for further credit.~~	BISC 101, 102, and **(**BISC 204 or GEOG 215**),** all with a **minimum** grade of C-.	[equivalent statement removed]	BISC 101, ~~BISC~~ 102, and ~~either~~ **(**BISC 204 or GEOG 215**)**~~,~~ all with a **minimum** grade of C- ~~or better~~. ~~Students who have completed Special Topics BISC 473 Aquatic Ecology may not take this course for further credit.~~
BISC 413 Fisheries Biology	BISC 204 with a grade of C- ~~or better~~. ~~Students who have taken BISC 472 with the title "Fisheries Ecology" may not take this course for further credit.~~	BISC 204 with a **minimum** grade of C-.	[equivalent statement removed]	BISC 204 with a **minimum** grade of C- ~~or better~~. ~~Students who have taken BISC 472 with the title "Fisheries Ecology" may not take this course for further credit.~~
BISC 414 Limnology	~~75 units of credit in a science program, including BISC 204 with a grade of C- or better or GEOG~~	**(BISC 204 or GEOG 215) with a minimum grade of C-.**		~~75 units of credit in a science program, including BISC 204 with a grade of C- or better or GEOG 215, or permission of the instructor.~~

	~~215, or permission of the instructor.~~			(**BISC 204 or GEOG 215) with a minimum grade of C-.**
BISC 420 Community Ecology	BISC 204 or GEOG 215~~;~~ with a grade of C- ~~or better~~. ~~Students who have completed BISC 304 or BISC 404 may not take BISC 420 for further credit.~~	**(**BISC 204 or GEOG 215**)** with a **minimum** grade of C-.	[equivalent statement removed]	**(**BISC 204 or GEOG 215**)**~~;~~ with a **minimum** grade of C- ~~or better~~. ~~Students who have completed BISC 304 or BISC 404 may not take BISC 420 for further credit.~~
BISC 421 Models in Biology: From Molecules to Migration	~~MATH 150 or 151, and 152 both with a grade of C+ or better, or MATH 154 and 155 both with a grade of B or better; and at least 60 units; or permission of the instructor. Recommended: A 100 level Biology course.~~ ~~Students who have taken Special Topics course BISC 475 "Movement, Molecules, and Models" may not take BISC 421 for further credit.~~	**BISC 100, 101, or 102, with a minimum grade of C-; and MATH 154 (or equivalent) with a minimum grade of B; and at least 60 units; or permission of the instructor.**	[equivalent statement removed]	~~MATH 150 or 151, and 152 both with a grade of C+ or better, or MATH 154 and 155 both with a grade of B or better; and at least 60 units; or permission of the instructor. Recommended: A 100-level biology course.~~ **BISC 100, 101, or 102, with a minimum grade of C-; and MATH 154 (or equivalent) with a minimum grade of B; and at least 60 units; or permission of the instructor.** ~~Students who have taken Special Topics course BISC 475 "Movement, Molecules, and Models" may not take BISC 421 for further credit.~~
BISC 422 Population Genetics	BISC 202 with a grade of C- ~~or better and STAT 201.~~	BISC 202 **and STAT 201, both** with a **minimum** grade of C-. **Recommended: BISC 300**		BISC 202 **and STAT 201, both** with a grade of **minimum** C- ~~or better and STAT 201~~.**Recommended: BISC 300.**

BISC 423 Developmental Neurobiology	~~BISC 101, BISC 102,~~ BISC 202, MBB 222, MBB 231~~;~~ all with a grade of C- ~~or better~~. Recommended: BISC 333 or MBB 331. ~~Students with credit for MBB 444 may not take this course for further credit. Students who have taken Special Topics BISC 472 or BISC 474 Nervous System Development may not take this course for further credit.~~	BISC 202, MBB 222, **and** MBB 231**,** all with a **minimum** grade of C-. Recommended: BISC 333 or MBB 331.	[equivalent statement removed]	~~BISC 101, BISC 102,~~ BISC 202, MBB 222, **and** MBB 231~~;~~**,** all with a **minimum** grade of C- ~~or better~~. Recommended: BISC 333 or MBB 331. ~~Students with credit for MBB 444 may not take this course for further credit. Students who have taken Special Topics BISC 472 or BISC 474 Nervous System Development may not take this course for further credit.~~
BISC 424 Applied Genomics	~~BISC 101, BISC 102,~~ BISC 202, MBB 222, MBB 231, and ~~either~~ BISC 357 or MBB 331~~;~~ all with a grade of C- ~~or better~~. ~~Students who have taken Special Topics BISC 471 Applied Genomics may not take this course for further credit.~~	BISC 202, MBB 222, MBB 231, and **(**BISC 357 or MBB 331**)**, all with a **minimum** grade of C-.	[equivalent statement removed]	~~BISC 101, BISC 102,~~ BISC 202, MBB 222, MBB 231, and ~~either~~ **(**BISC 357 or MBB 331~~;~~**),** all with a **minimum** grade of C- ~~or better~~. ~~Students who have taken Special Topics BISC 471 Applied Genomics may not take this course for further credit.~~
BISC 425 Sensory Biology	BISC 205 ~~(~~or BPK 205) and MBB 231 with a grade of C- ~~or better~~. ~~Students who have taken special topics courses BISC 471 or 473 with the title "Sensory~~	**(**BISC 205 or BPK 205) and MBB 231**, both** with a **minimum** grade of C-.	[equivalent statement removed]	**(**BISC 205 ~~(~~or BPK 205) and MBB 231**, both** with a **minimum** grade of C- ~~or better~~. ~~Students who have taken special topics courses BISC 471 or 473 with the title~~

	~~Biology" may not take this course for further credit.~~			~~"Sensory Biology" may not take this course for further credit.~~
BISC 428 Cell Anatomy	BISC 101, BISC 102, MBB 222 and MBB 231, all with a minimum grade of C-. Students who have completed BISC 472 under the title "Advanced Cell Biology" may not take this course for further credit.	BISC 101, BISC 102, MBB 222**,** and MBB 231, all with a minimum grade of C-.	Students who have completed BISC 472 under the title "Advanced Cell Biology" may not take this course for further credit.	BISC 101, BISC 102, MBB 222**,** and MBB 231, all with a minimum grade of C-. Students who have completed BISC 472 under the title "Advanced Cell Biology" may not take this course for further credit.
BISC 430 Microbe-Plant Interactions	MBB 231 and ~~at least one of~~ BISC 303, BISC 328, BISC 337, or BISC 366, both with a grade of C- ~~or better~~.	MBB 231 and (BISC 303, **or** BISC 328, **or** BISC 337, or BISC 366), both with a **minimum** grade of C-.		MBB 231 and ~~at least one of~~ **(**BISC 303, **or** BISC 328, **or** BISC 337, or BISC 366**)**, both with a **minimum** grade of C- ~~or better~~.
BISC 440W Biodiversity	BISC 300~~,~~ STAT 201 ~~or equivalent~~, both with ~~C or better~~, ~~plus~~ 75 units. ~~Students with credit for BISC 440 may not repeat this course for further credit.~~	BISC 300 **and** STAT 201, both with **a minimum grade of C+; and** (75 units **or permission of the instructor)**.	[equivalent statement removed]	BISC 300~~,~~ **and** STAT 201 ~~or equivalent~~, both with **a minimum grade of C+** ~~C or better~~, ~~plus~~ **and (**75 units **or permission of the instructor)**. ~~Students with credit for BISC 440 may not repeat this course for further credit.~~
BISC 441 Evolution of Health and Disease	BISC 202 or 204 with a grade of C- ~~or better~~. Recommended: BISC 300.	BISC 202 or 204**, both** with a **minimum** grade of C-. Recommended: BISC 300.		BISC 202 or 204**, both** with a **minimum** grade of C- ~~or better~~. Recommended: BISC 300.

BISC 445 Environmental Physiology of Animals	BISC 205 and MBB 231 with a grade of C- ~~or better~~.	BISC 205 and MBB 231**, both** with a **minimum** grade of C-.		BISC 205 and MBB 231**, both** with a **minimum** grade of C- ~~or better~~.
BISC 455 Endocrinology	BISC 205, MBB 231 and ~~one of~~ BISC 306 or BISC 316 with a grade of C- ~~or better~~.	BISC 205, MBB 231**,** and **(**BISC 306 or BISC 316**), all** with a **minimum** grade of C-.		BISC 205, MBB 231**,** and ~~one of~~ **(**BISC 306 or BISC 316**), all** with a **minimum** grade of C- ~~or better~~.
BISC 457 Plant Molecular Biology and Biotechnology	MBB 222, MBB 231 with a grade of C- ~~or better~~.	**BISC 202**, MBB 222, **and** MBB 231**, all** with a **minimum** grade of C-.		**BISC 202**, MBB 222, **and** MBB 231**, all** with a **minimum** grade of C- ~~or better~~.

(Last updated October 31, 2022)

SENATE COMMITTEE ON UNDERGRADUATE STUDIES

COURSE MODIFICATION FORM

COURSE SUBJECT BISC **NUMBER** 205 **TITLE** Principles of Physiology

TYPE OF CHANGES. Please type 'X' for the appropriate revision(s):

Course number	☐	Units	☐	Prerequisite	☒
Title	☐	Description	☒	Equivalent Statement	☐

WORDING/DESCRIPTION EDITS. Indicate deleted or changed text using ~~strike through~~, indicate added or new text using underline. If you need to enter more text than the box allows, drag the endpoint of the text box to make it bigger, as it will not automatically expand. Please review the "Equivalency statements" section under Information about specific course components if changing equivalent statement(s).

An integrated exploration of animal and plant physiology, using principles from biology, physics, and chemistry to describe the underlying mechanisms and adaptations that support life. Systems include transport, metabolism, electrical & chemical signalling, sensing and responding. ~~Students will build independent and collaborative skills in data analysis, scientific reasoning, and communication.~~

Pre-requisites: BISC 101, BISC 102, **and** PHYS 101, ~~and PHYS 102,~~ all with a **minimum** grade of C- ~~or better~~.

EFFECTIVE TERM AND YEAR FOR CHANGES

Fall, Spring, Summer and year (please enter in textbox)

Fall 2023

RATIONALE (must be included)

The course description is being modified to remove skills that are not consistently taught across all offerings of the course.

The Biological Sciences Major/Honours program requirements are being changed, and students are no longer required to take PHYS 102. The change in BISC 205 pre-requisites aligns with the changes to our program requirements.