UNBC | UNIVERSITY OF NORTHERN BRITISH COLUMBIA

SENATE MEETING
OPEN SESSION
MINUTES
November 23, 2022
3:30 – 5:30 PM
Senate Chambers/Zoom

Present: J. Bankole, J. Chavez Suazo, C. Claassens, T. Fyfe, M. Gehloff, M. Hawes (Acting Secretary of Senate),C. Ho Younghusband, D. Huber, R. Jafari, H. Kazemian, J. King, T. Klassen-Ross, A. Kranz, K. Lewis, K. Long, B. Menounos (non-voting), Nicole Neufeld, D. Nyce, A. Parent (Recording Secretary), A. Palmer, G. Payne (Chair), K. Rennie, D. Roberts, R. Robinson, W. Rodgers, R. Schiff, K. Stathers, F. Tong, C. Walsh, T. Whitcombe, E. Wilson, J. Zhou, S. Zogas (Vice-Chair),

Regrets: S. Akram, J. Allen, R. Camp II, L. Chen, A. Constantin, B. Deo, D. Desai, B. Durau, K. Fredj, T. Fuson (non-voting), N. Hanlon, C. Hofsink, L. Haslett, P. Reiners, K. Read (Interim Secretary of Senate), N. Shah, R. Somani (non-voting), P. Winwood (non-voting),

The meeting commenced at 3:33 p.m.

The Chair welcomed Marlina Hawes as the acting Secretary of Senate for Interim Secretary of Senate (non-voting), Kimberly Read and Nicole Neufeld as the acting officer at Senate for the Director of Continuing Studies, Lisa Haslett (voting member).

The Chair reported one vacancy for a Faculty Member at Large and one vacancy for a Student from the Faculty of Environment.

1.0 Acknowledgement of Territory
The Chair acknowledged that he is joining the meeting from the traditional territory of the Lheidli T'enneh and welcomed other Senators online to acknowledge the ancestral and traditional territories of their locations in the chat.

2.0 S-202211.01
Approval of the Agenda
Rennie
That the agenda for the November 23, 2022 Open Session of Senate be approved as presented.
CARRIED

3.0 Presentations

3.1 Internet Security
Dave Kubert, Chief Information Security Officer presented on Information Security for Postsecondary Institution. *(Presentation & Discussion 27 minutes)* Presentation Appendix 1.

3.2 UNBC Strategic Plan
Wendy Rodgers, Vice President Academic & Provost and Arleta Lucarelli, Executive Director – Strategy & Staff presented on the UNBC Strategic Plan Renewal. *(Presentation & Discussion 20 minutes)* Presentation Appendix 2.

4.0 Approval of the Minutes

S-202211.02
Approval of the Minutes
Whitcombe
That the Minutes for the October 26, 2022 Open Session of Senate be approved as presented.
CARRIED

5.0   Business Arising
None.

6.0   President's Report   Payne

The President reported that search for the Vice President, Research is underway and invites Senator to participate in the on-campus interviews in the coming weeks.

The President reported that in October he had attended the Universities Canada Presidents Meetings in Ottawa as well as the Times Higher Education meeting of Universities and Sustainable Development Goals at the University of Glasgow.

The President reported to Senate on the past Board meeting. His full report is in the Public Session of the Board.

The President reported on the Commemorative Ceremony for the Remembrance and Action on Violence Against Women and the Accessibility Ambassadors Initiative Open House.

7.0   Report of the Provost *(5 minutes)*   **Rodgers**

The VPAP reported that she continues work on the determination of the key strategic priorities for November 2022 to August 2023 include recruitment, retention, digital infrastructure, data, other infrastructure design to support innovation, effectiveness and human satisfaction, inclusivity, and reputation. She continues to welcome all information and questions.

8.0   Report of the Registrar *(5 minutes)*   **Hawes**

Ms. Hawes reported on behalf of Registrar Read on International Education scheduling and grading.

9.0   Question Period *(10 minutes)*

9.1   Written questions submitted in advance

9.1.1   Could you provide a specific due date and information on the current consultative process for the honorarium policy, as it has now been in the works for almost a year. IWAU needs it, as does the First Nations Centre, really soon. When do you anticipate a final policy being developed? (Senator Huber)

Ms. Howitt reported that a working draft has been developed, which is with the Office of University Governance for initial review and feedback; however, it is a complex issue and still requires considerable input from the Offices of Indigenous Initiative and EDI, as well as significant consultation with those who engage Indigenous or other traditional knowledge keepers. This has been delayed given staffing transition and further updates will be provided in future. The current policy remains in place until the new policy or is approved.

9.1.2   It seems, from previous discussion at Senate, that all tuition and fees from graduate students goes into general revenue and then is dispersed for various needs. Currently we are seeing reduced research and travel funding for grad students, no funding for our NRES grad coordinator, no dedicated funding for social and cohort-building activities, etc. It will be increasingly difficult to run a viable grad program under these circumstances, so what is the rationale for the current funding model and is there any thought of changing it to better provide in these and other areas? (Senator Huber)

Vice President, Finance and Administration Somani reported that nearly all revenue, especially the provincial operating grant and student tuition and fees, are pooled centrally and then distributed to all programs based on their budget. Any specific funding received from a particular program, for instance, graduate scholarship is solely used for the designated purpose i.e., graduate awards. In terms of tuition revenue, the budget 2022-23 for graduate tuition (excluding MBA program) is $2.46M, whereas the total expenditure for all academic programs i.e., five faculties (excluding the Division of Medical Sciences is $42.21M. Within the overall budget envelop, we are also striving to provide flexibility to adapt the unit priorities and budget as needed.

Vice President, Research Lewis provided data on the student stipend funding (government and internal) and the Student travel and research awards). Appendix 3

9.1.3 Low per diem levels affect graduate students and faculty and staff. In the case of faculty, it affects their ability to compensate students on research or conference (etc.) trips. And of course, it means that students and faculty need to pay out-of-pocket for meal expenses. This can be an EDI issue as it may affect access to scholarly experiences for some individuals or groups. Per diem levels have not increased from $54 a day since at least 2005 when I arrived, and from what we can tell, that was the level in the 90s, perhaps as far back as the origin of the institution. Decades of inflation (particularly recently) have eroded the purchasing power of the per diem, and it is time for it to be increased. Is there a plan to do so? (Senator Huber)

Vice President, Finance and Administration Somani reported that while the per diem rates have not been updated for a long time, UNBC has monitored its rates as compared to other western Canadian institutions over the years. Until recently, UNBC rates have been within a reasonable range of other institutions. Having said that, the updated per-diem rates that are higher than the current rates have been included in the revised travel and business expense policy and procedure that are currently being reviewed by the Office of University Governance and they will be coordinating the next steps for the approval of revised policy and procedure. Given the staffing challenges, it is anticipated the revised policy and procedure will be shared with the UNBC community for comments in January/February 2023.

9.2 Questions from the floor

9.2.1 Senator Chavez asked how to propose a review of a program name be initiated. She would like a different term for the use of natural resources in the environmental science program. She would like the university to consider a more encompassing name that reflects sustainability.

The President indicated that this would need to be discussed at the Faculties and then the Senate Committee on Academic Affairs. He asked Vice President Rodgers to bring this question to the Deans, Faculties and Senate Committee on Academic Affairs.

10.0 Approval of Motions on the Consent Agenda   Payne

S-202211.03
Approval of Motions on the Consent Agenda
Huber
That the motions on the consent agenda, except for those removed for placement on the regular agenda, be approved as presented.
CARRIED

11.0 Committee Reports

11.1 Senate Committee on Student Appeals   Klassen-Ross
No report

11.2 Senate Committee on Academic Affairs   Rodgers

For Approval:

Items .04 to .06 were approved as an omnibus motion.

> **S-202211.04**
> **Proposed Revision of Calendar Entry**
> Zogas
> That, on the recommendation of the Senate Committee on Academic Affairs, the changes to the Wilp Wilxo'oskwhl Nisg̱a'a Certificate of Nisg̱a'a Language Fluency be approved as proposed.
> **Effective date**: September 2023
> CARRIED

The Nisg̱a'a Language Fluency Certificate provides an immersive education in the Nisg̱a'a language, intended to create new Nisg̱a'a language speakers. The fundamental pedagogical approach is to offer as much Nisg̱a'a language instruction as possible, as early as possible. The program is offered in a manner that recognizes that learners, knowledge keepers, and their communities as a whole benefit from, and contribute to, the (re)development of Nisg̱a'a language fluency.

In terms of goals and objectives, the program is designed to increase significantly the number of Nisg̱a'a language speakers, and to prepare them for employment, particularly in the fields of education and a variety of Nisg̱a'a organizations.

Students are required to complete 30 credit hours of university-level instruction.

During the program of study leading to the Certificate students complete the following courses. All courses listed will be included in the UNBC academic calendar for students.

~~Students are required to complete 30 credit hours~~.

ARTS 101-3	Learning Strategies
ARTS 102-3	Research Writing
or ENGL 170	Writing and Communication Skills
FNST 139-3	Nisg̱a'a Language: Level 1
FNST 140-3	Nisg̱a'a Language: Level 2
FNST 141-3	Nisg̱a'a Language Immersion Level 1
FNST 169-3	Nisg̱a'a Culture: Level 1
FNST 170-3	Nisg̱a'a Culture: Level 2
FNST 241-3	Nisg̱a'a Language Immersion Level 2
FNST 142-3	Nisg̱a'a Oral Culture Level 1
FNST 242-3	Nisg̱a'a Oral Culture Level 2
~~FNST 341-3~~	~~Nisg̱a'a Language Immersion Level 3~~
~~FNST 441-3~~	~~Nisg̱a'a Language Immersion Level 4~~

> **S-202211.05**
> **Proposed Revision of Calendar Entry**
> Zogas
> That, on the recommendation of the Senate Committee on Academic Affairs, the changes to the Diploma of Wilp Wilxo'oskwhl Nisg̱a'a Language Fluency be approved as proposed.
> **Effective date:** September 2023
> CARRIED

The Nisg̱a'a Language Fluency Diploma provides an immersive education in the Nisg̱a'a language, ~~and is~~ intended to create new ~~and fluent~~ Nisg̱a'a language speakers. The fundamental pedagogical approach is to offer as much Nisg̱a'a language instruction as possible, as early as possible. The program is offered in a manner that recognizes that learners, knowledge keepers, and their communities as a whole benefit from, and contribute to, the (re)development of Nisg̱a'a language fluency.

In terms of goals and objectives, the program is designed to increase significantly the number of Nisg̱a'a language speakers, and to prepare them for employment, particularly in the fields of education and a variety of Nisg̱a'a organizations.

Students are required to complete 60 credit hours ~~of university level instruction~~, including 30 credit hours from the Nisg̱a'a Language Fluency Certificate.

Curriculum:

The first year of the Diploma is the Certificate, and students take the following courses:

ARTS 101-3	Learning Strategies
ARTS 102-3	Research Writing
or ENGL 170	Writing and Communication Skills
FNST 139-3	Nisg̱a'a Language: Level 1
FNST 140-3	Nisg̱a'a Language: Level 2
FNST 141-3	Nisg̱a'a Language Immersion Level 1
FNST 169-3	Nisg̱a'a Culture: Level 1
FNST 170-3	Nisg̱a'a Culture: Level 2
FNST 241-3	Nisg̱a'a Language Immersion Level 2
FNST 142-3	Nisg̱a'a Oral Culture Level 1
FNST 242-3	Nisg̱a'a Oral Culture Level 2

During the second year of the Diploma students take the following courses:

CPSC 150-3	Computer Applications
or 3-credits of Mathematics at any level	
~~FNST 142-3~~	~~Nisg̱a'a Oral Culture Level 1~~
~~FNST 205-3~~	~~Seminar in First Nations Studies~~
~~FNST 206-3~~	~~First Nations Oral Literatures~~
FNST 220-3	Introduction to Linguistics
FNST 239-3	Nisg̱a'a Language: Level 3
FNST 240-3	Nisg̱a'a Language: Level 4
~~FNST 242-3~~	~~Nisg̱a'a Oral Culture Level 2~~
FNST 269-3	Nisg̱a'a Culture: Level 3
FNST 270-3	Nisg̱a'a Culture: Level 4
~~FNST 298-3~~	~~Special Topics in First Nations Studies~~
FNST 341-3	Nisg̱a'a Language Immersion Level 3
FNST 441-3	Nisg̱a'a Language Immersion Level 4

Subject Requirement

Six additional credit hours of electives at any level; it is recommended that these be taken in the second year.

S-202211.06
Proposed Revision of Calendar Entry
Zogas
That, on the recommendation of the Senate Committee on Academic Affairs, the changes to the Wilp Wil<u>x</u>o'oskwhl Nisg̱a'a Bachelor of Nisg̱a'a Language Fluency Degree be approved as proposed
Effective date: September 2023
CARRIED

The Bachelor of Nisg̱a'a Language Fluency degree provides an immersive education in the Nisg̱a'a language, intended to create new Nisg̱a'a language speakers. The fundamental pedagogical approach is to offer as much Nisg̱a'a language instruction as possible, as early as possible. The program is offered in a manner that recognizes that learners, knowledge keepers, and their communities as a whole benefit from, and contribute to, the (re)development of Nisg̱a'a language fluency.

Students are required to complete 120 credit hours including a minimum of 60 credit hours of upper-division coursework. 84 credit hours (including 36 credit hours at the upper level) consists of courses with a Nisg̱a'a language component.

For the purpose of the Bachelor of Nisg̱a'a Language Fluency, all courses with Nisg̱a'a language, history and/or culture from the following areas are considered:
• Anthropology
• Arts
• Biology (Ethnobotany)
• First Nations Studies
• History

Curriculum:

During the first year of the degree students take the following courses:

ARTS 101-3	Learning Strategies
ARTS 102-3	Research Writing
or ENGL 170	Writing and Communication Skills
FNST 139-3	Nisg̱a'a Language: Level 1
FNST 140-3	Nisg̱a'a Language: Level 2
FNST 141-3	Nisg̱a'a Language Immersion Level 1
FNST 169-3	Nisg̱a'a Culture: Level 1
FNST 170-3	Nisg̱a'a Culture: Level 2
FNST 241-3	Nisg̱a'a Language Immersion Level 2
FNST 142-3	Nisg̱a'a Oral Culture Level 1
FNST 242-3	Nisg̱a'a Oral Culture Level 2

During the second year of the degree students take the following courses:

CPSC 150-3	Computer Applications

	or 3-credits of Mathematics at any level
~~FNST 142-3~~	~~Nisg̱a'a Oral Culture Level 1~~
~~FNST 205-3~~	~~Seminar in First Nations Studies~~
~~FNST 206-3~~	~~First Nations Oral Literatures~~
FNST 220-3	Introduction to Linguistics
FNST 239-3	Nisg̱a'a Language: Level 3
FNST 240-3	Nisg̱a'a Language: Level 4
~~FNST 242-3~~	~~Nisg̱a'a Oral Culture Level 2~~
FNST 269-3	Nisg̱a'a Culture: Level 3
FNST 270-3	Nisg̱a'a Culture: Level 4
~~FNST 298-3~~	~~Special Topics in First Nations Studies~~
FNST 341-3	Nisg̱a'a Language Immersion Level 3
FNST 441-3	Nisg̱a'a Language Immersion Level 4

Subject Requirement
Six additional credit hours of electives at any level; it is recommended that these be taken in the second year.

During the third year of the degree students take the following courses:

FNST 300-3	Research Methods in First Nations Studies
FNST 310-3 and	Lisims Anadromous Summer and Fall Fisheries in Nisg̱a'a Culture History
FNST 311-3 History	Spring Anadromous Fisheries of Lisims in Nisg̱a'a Culture and
FNST 320-3	The Structure of a First Nations Language
FNST 321-3	First Nations Advanced Composition and Conversation: Level 1
FNST 322-3	First Nations Advanced Composition and Conversation: Level 2
FNST 324-3	Advanced First Nations Language Immersion
FNST 325-3	First Nations Language Mentoring
BIOL 350-3	Ethnobotany

And ~~two~~ one of the following courses:

FNST 301-3	Art and Material Culture of BC First Nations
FNST 302-3	First Nations Health and Healing
FNST 303-3	First Nations Religion and Philosophy
FNST 304-3	Indigenous Environmental Philosophy
FNST 305-3	Seminar in First Nations Studies

During the fourth year of the degree students take the following courses:

FNST 400-3	Community-Based Research Project
FNST 420-3	Developing Language Materials
FNST 421-3	First Nations Songs and Poetry
FNST 422-3	First Nations Speeches and Stories

FNST 423-3   A Study of a First Nations Language Family and Its Linguistic
    Relatives
FNST 425-3   Oral History

And two of the following courses:

FNST 410-6   Advanced Topics in First Nations Art and Material Culture
FNST 440-6   Internship in First Nations Studies
FNST 497-6   Senior Project in First Nations Studies
FNST 498-6   Special Topics in First Nations Studies

An Executive Summary - FALL 2023 CHANGES TO THE MATHEMATICS DEGREE PROGRAM was included in the meeting package.

Items .07 to .08 were approved as an omnibus motion.

> **S-202211.07**
> **New Course Approval – MATH 202-3**
> Whitcombe
> That, on the recommendation of the Senate Committee on Academic Affairs, the new course MATH 202-3 Multivariable Calculus be approved as follows:
> **Effective date:** September 2023
> CARRIED

MATH 202-3 Multivariable Calculus I

This course focuses on functions of several variables, analytic geometry, and their utility. It starts with a review of area and arclength in polar coordinates, and lines and planes in space. The course covers cylindrical and spherical coordinates, quadric surfaces, vector-valued functions, and arclength and curvature of space curves. Topics in this course also include differentiation of functions of several variables, tangent planes and linear approximations, the chain rule, minima/maxima, and Lagrange multipliers. Lastly, the course covers double and triple integrals, applications, and change of variables in multiple integrals.

Prerequisites: MATH 101-3
Precluded: MATH 200-3

> **S-202211.08**
> **New Course Approval – MATH 204-3**
> Whitcombe
> That, on the recommendation of the Senate Committee on Academic Affairs, the new course MATH 204-3 Multivariable Calculus II be approved as follows:
> **Effective date:** January 2024
> CARRIED

This course focuses on vector calculus and power series. The course consists of two major parts. The first part addresses Green's theorem, Stokes's formula and the divergence theorem (Gauss's formula), including vector fields, line integrals, conservative vector fields, divergence and curl, parametric surfaces, and surface integrals of vector or scalar fields. Applications include computing the mass flow rate, the surface area of a parametric surface and the volume of a three-dimensional body via Stokes's or Gauss's formula. The other part of the course deals with power series, their convergence, and their use in approximating functions via Taylor's theorem.

Prerequisites: MATH 202-3
Precluded: MATH 200-3

> **S-202211.09**
> **Proposed Revision of Calendar Entry – MATH 101-3**
> Huber
> That, on the recommendation of the Senate Committee on Academic Affairs, the changes to the course description and prerequisites for MATH 101-3, Calculus II, on page 271 of the 2022/23 undergraduate calendar, be approved as proposed.
> **Effective date:** September 2023
> CARRIED

~~**MATH 101-3 Calculus II** This course provides a continuation of MATH 100-3. Areas of study include the definition of the natural logarithm as an integral and of the exponential function as its inverse, integration by parts, miscellaneous techniques of integration, improper integrals, volumes by slicing and by shell techniques, the trapezoidal rule and Simpson's rule, infinite sequences and series, Taylor series, masses, volumes, moments, centre of mass, first order linear differential equations, definition of partial derivatives. All sections of this course are taught using Maple software.~~
~~Prerequisites: MATH 100-3 or MATH 105-3~~

MATH 101-3 Calculus II <u>This course focuses on integral calculus for a single variable. The course covers the definition of the natural logarithm as an integral and the exponential function as its inverse, integration by parts, techniques of integration, volumes by slicing and shell techniques, improper integrals, numerical integration, and applications of integration (e.g., computing arc lengths, surface areas, moments and centres of mass), calculus of parametric curves and polar curves with special emphasis on applications of integration in computing areas and arc lengths in polar coordinates. It also covers sequences, numerical series, power series, and Taylor's theorem.</u>
<u>Prerequisites: MATH 100-3</u>

> **S-202211.10**
> **Proposed Revision of Calendar Entry – MATH and PHYS**
> Huber
> That, on the recommendation of the Senate Committee on Academic Affairs, the change(s) to the Joint Major in Mathematics and Physics Program Requirements on pages 149 and 150 of the PDF 2022/23 undergraduate calendar, be approved as proposed.
> **Effective date:** September 2023
> CARRIED

The minimum requirement for completion of a Bachelor of Science with a Joint Major in Mathematics and Physics is 125 credit hours.

MATH 150-3 (Finite Mathematics for Business and Economics) may not be used for credit towards any Mathematics major or joint major.

Program Requirements

Lower-Division Requirement

CPSC 100-4   Computer Programming I
MATH 100-3   Calculus I
MATH 101-3   Calculus II
~~MATH 200-3   Calculus III~~

MATH 201-3   ~~Introduction to Complex Analysis~~
MATH 202-3   Multivariable Calculus I
MATH 204-3   Multivariable Calculus II
MATH 220-3   Linear Algebra
MATH 230-3   Linear Differential Equations and Boundary Value Problems
PHYS 110-4   Introductory Physics I: Mechanics
PHYS 111-4   Introductory Physics II: Waves and Electricity
PHYS 200-3   Thermal Physics
PHYS 202-4   Electromagnetism and Optics
PHYS 205-3   Modern Physics I
PHYS 206-3   Modern Physics II

Upper-Division Requirement

MATH 301-3   Introduction to Complex Analysis
MATH 320-3   Survey of Algebra
MATH 326-3   Advanced Linear Algebra
MATH 335-3   Introduction to Numerical Methods
MATH 336-3   Intermediate Differential Equations
~~STAT 371-3   Probability and Statistics for Scientists and Engineers~~
PHYS 300-3   Classical Mechanics
PHYS 302-3   Quantum Mechanics I
PHYS 310-3   Classical Electromagnetism I
PHYS 400-3   Quantum Mechanics II
PHYS 407-3   Statistical Mechanics
PHYS 410-3   Classical Electromagnetism II
STAT 371-3   Probability and Statistics for Scientists and Engineers

Subject Upper-Division Requirements: 9 additional upper-division credit hours are required from MATH or STAT courses, of which at least 6 must be at the 400 level. ~~An additional 6 credit hours of the 300- or 400-level PHYS courses are required. Of these combined Subject Upper-Division Requirements, at least 9 credit hours must be at the 400 level.~~ An additional 6 upper-division credit hours of PHYS courses are required, of which at least 3 credit hours must be at the 400 level.

Elective and Academic Breadth
Elective credit hours must be taken as necessary to ensure completion of a minimum of 125 credit hours including any additional credits necessary to meet the Academic Breadth requirement of the University (see Academic Regulation 15).

> **S-202211.11**
> **Proposed Revision of Calendar Entry – MATH 201-3**
> Huber
> That, on the recommendation of the Senate Committee on Academic Affairs, the changes to the course title, course description, and course prerequisites for MATH 201-3, Introduction to Complex Analysis, on page 272 of the 2022/23 undergraduate calendar, be approved as proposed.
> **Effective date:** September 2023
> CARRIED

MATH ~~201~~ 301-3 Introduction to Complex Analysis This course is an introduction to complex analysis. Topics include complex numbers and topology of the complex plane, theory of analytic functions, precise definition of limit and continuity, harmonic functions, contour integration, Cauchy's integral theorem and integral formula, bounds for analytic functions and applications, Taylor and Laurent expansions of ~~series representation for~~ analytic functions, zeros and singularities of analytic functions, and residue theory. ~~the fundamental theorem of algebra.~~
Prerequisites: MATH 200-3 or MATH 202-3
Precluded: MATH 201-3

Joint Major in Chemistry and Mathematics (BSc)

The minimum requirement for completion of a Bachelor of Science with a Joint Major in Chemistry and Mathematics is 125 credit hours. MATH 342-3 (Biostatistics) may not be used for credit towards any Mathematics major, minor, or joint major. MATH 150-3 (Finite Mathematics for Business and Economics) may not be used for credit towards any Mathematics major or joint major.

Program Requirements

Lower-Division Requirement

CHEM 100-3 General Chemistry I
CHEM 101-3 General Chemistry II
CHEM 120-1 General Chemistry Lab I
CHEM 121-1 General Chemistry Lab II
CHEM 200-3 Physical Chemistry I
CHEM 201-3 Organic Chemistry I
CHEM 202-3 Inorganic Chemistry I
CHEM 203-3 Organic Chemistry II
CHEM 210-3 Analytical Chemistry I
CPSC 100-4 Computer Programming I
MATH 100-3 Calculus I
MATH 101-3 Calculus II
~~MATH 201-3 Calculus III~~
<u>MATH 202-3 Multivariable Calculus I</u>
<u>MATH 204-3 Multivariable Calculus II</u>
~~MATH 201-3 Introduction to Complex Analysis~~
MATH 220-3 Linear Algebra
MATH 230-3 Linear Differential Equations and Boundary Value Problems
PHYS 110-4 Introductory Physics I: Mechanics
PHYS 111-4 Introductory Physics II: Waves and Electricity

Upper-Division Requirement

Chemistry

CHEM 300-3 Physical Chemistry II
  or CHEM 305-3 Physical Chemistry III
CHEM 310-3 Analytical Chemistry II
CHEM 320-3 Inorganic Chemistry II
  or CHEM 321-3 Inorganic Chemistry III

Nine credit hours of 300- or 400-level Chemistry*
Six credit hours of 400-level Chemistry*

*Up to 6 credit hours from BCMB 306-3, BCMB 308-3, BCMB 330-3, BCMB 340-3, BCMB 401-3, BCMB 402-3, BCMB 403-2, or BCMB 405-3 may be used to satisfy these requirements.

Mathematics

MATH 301-3 Introduction to Complex Analysis
MATH 320-3 Survey of Algebra
MATH 326-3 Advanced Linear Algebra
MATH 335-3 Introduction to Numerical Methods
STAT 371-3 Probability and Statistics for Scientists and Engineers

Six credit hours of 300- or 400-level Mathematics*;
and Six credit hours of 400-level Mathematics

*Between the two disciplines, a minimum of 15 credit hours at the 400 level must be completed.

Elective and Academic Breadth
Elective credit hours must be taken as necessary to ensure completion of a minimum of 125 credit hours including any additional credits necessary to meet the Academic Breadth requirement of the University (see Academic Regulation 15).

> **S-202211.13**
> **Proposed Revision of Calendar Entry – MATH and STATS**
> Huber
> That, on the recommendation of the Senate Committee on Academic Affairs, the changes to the program requirements for the B.Sc. Mathematics and Statistics on page 158 and 159 of the 2022/2023 undergraduate calendar be approved as proposed.
> **Effective date:** September 2023
> CARRIED

Program Requirements

Note: Unless otherwise stated, students enrolling in any MATH or STAT courses with prerequisites are required to have completed all prerequisite courses for that course with a C- (60%) or better, or have permission to enroll from the Department Chair. If the prerequisite course is a BC high school course, the minimum required grade is a C (60%).

Literacy Requirement

One of the following:
      ENGL 170-3 Writing and Communication Skills
      ENGL 270-3 Expository Writing

Lower-Division Requirement

100 Level

CPSC 100-4 Computer Programming I
CPSC 141-3 Discrete Computational Mathematics
MATH 100-3 Calculus I
MATH 101-3 Calculus II

200 Level

~~MATH 200-3 Calculus III~~
~~MATH 201-3 Introduction to Complex Analysis~~
<u>MATH 202-3 Multivariable Calculus I</u>
<u>MATH 204-3 Multivariable Calculus II</u>
MATH 220-3 Linear Algebra
MATH 224-3 Foundations of Modern Mathematics
MATH 230-3 Linear Differential Equations and Boundary Value Problems

Recommended

CPSC 101-4 Computer Programming II
CPSC 242-3 Mathematical Topics for Computer Science

General Requirement

Two of the following:
    BIOL 103-3 Introductory Biology I
        and BIOL 123-1 Introductory Biology I Laboratory
    BIOL 104-3 Introductory Biology II
        and BIOL 124-1 Introductory Biology II Laboratory
    CHEM 100-3 General Chemistry I
        and CHEM 120-1 General Chemistry Lab I
    CHEM 101-3 General Chemistry II
        and CHEM 121-1 General Chemistry Lab II
    PHYS 100-4 ~~Introduction to Physics~~ <u>Physics for Life Sciences I</u>
        or PHYS 110-4* Introductory Physics I<u>: Mechanics</u>
    PHYS 111-4* Introductory Physics II: Waves and Electricity

    *Note: PHYS 110-4 (Introductory Physics I: Mechanics) and PHYS 111-4 (Introductory Physics II: Waves and Electricity) are strongly recommended for all majors.

Upper-Division Requirement

300 Level

<u>MATH 301-3 Introduction to Complex Analysis</u>
MATH 302-3 Introductory Mathematical Analysis

MATH 320-3 Survey of Algebra

MATH 336-3 Intermediate Differential Equations
   or MATH 335-3 Introduction to Numerical Methods

STAT 371-3 Probability and Statistics for Scientists and Engineers

STAT 372-3 Mathematical Statistics

300 or 400 Level

MATH 326-3 Advanced Linear Algebra
   or MATH 405-3 Topology

400 Level

Twelve additional credit hours in Mathematics or Statistics at the 400 level.

Elective and Academic Breadth

Elective credit hours <u>must be taken</u> as necessary to ensure completion of a minimum of 120 credit hours including any additional credits necessary to meet the Academic Breadth requirement of the University (see Academic Regulation 15).

> **S-202211.14**
> **Proposed Revision of Calendar Entry – PHYS**
> Huber
> That, on the recommendation of the Senate Committee on Academic Affairs, the change(s) to the Major in Physics Program Requirements on page180 of the PDF 2022/23 undergraduate calendar be approved as proposed.
> **Effective date:** September 2023
> CARRIED

Major in Physics

A major in Physics requires students to complete ~~49~~ <u>58</u> credit hours of Physics; ~~2727~~ <u>36</u> credit hours of these must be at the upper-division level.

The minimum requirement for completion of a Bachelor of Science degree with a major in Physics is 120 credit hours.

Program Requirements

Lower-Division Requirement

100 Level

CHEM 100-3 General Chemistry I
MATH 100-3 Calculus I
MATH 101-3 Calculus II
PHYS 110-4 Introductory Physics I: Mechanics
PHYS 111-4 Introductory Physics II: Waves and Electricity
CPSC 100-4 Computer Programming I
   or CPSC 110-3   Introduction to Computer Systems and Programming

200 Level

~~MATH 200-3 Calculus III~~
~~MATH 201-3 Introduction to Complex Analysis~~
~~MATH 202-3 Calculus III~~
~~MATH 201-3 Introduction to Complex Analysis~~

MATH 202-3   Multivariable Calculus I
MATH 204-3   Multivariable Calculus II
MATH 220-3   Linear Algebra
MATH 230-3   Linear Differential Equations and Boundary Value Problems
PHYS 200-3   Thermal Physics
PHYS 202-4   Electromagnetism and Optics
PHYS 205-3   Modern Physics I
PHYS 206-4   Modern Physics II

~~Four additional credit hours at the 200 level.~~
~~Four additional credit hours at the 200 level.~~

Upper-Division Requirement

300 Level
MATH 301-3   Introduction to Complex Analysis
MATH 336-3   Intermediate Differential Equations
PHYS 300-3   Classical Mechanics
PHYS 302-3   Quantum Mechanics I
PHYS 310-3   Classic Electromagnetism I
PHYS 390-3   Advanced Physics Laboratory

400 Level
PHYS 400-3   Quantum Mechanics II
PHYS 401-3   Seminar on Contemporary Topics in Physics
PHYS 404-3   Solid State Physics
PHYS 407-3   Statistical Mechanics
PHYS 410-3   Classic Electromagnetism II

Nine additional credit hours of Physics at the 300 or 400 level~~.~~

Elective and Academic Breadth
Elective credit hours <u>must be taken</u> as necessary to ensure completion of a minimum of 120 credit hours including any additional credits necessary to meet the Academic Breadth requirement of the University (see Academic Regulation 15).

Recommended electives include:
~~CPSC 101-4   Computer Programming II~~
CHEM 101-3   General Chemistry II
CHEM 200-3   Physical Chemistry I
CPSC 101-4   Computer Programming II
MATH 335-3   Introduction to Numerical Methods
STAT 371-3   Probability and Statistics for Scientists and Engineers

> **S-202211.15**
> **Proposed Revision of Calendar Entry – PHYS 111-4**
> Huber
> That, on the recommendation of the Senate Committee on Academic Affairs, the change(s) to the course description for PHYS 111-4, Introductory Physics II: Waves and Electricity on page 289 of the PDF 2022/23 undergraduate calendar, be approved as proposed.
> **Effective date:** September 2023
> CARRIED

PHYS 111-4 Introductory Physics II: Waves and Electricity

<u>This course is the s</u>~~S~~econd part of the calculus-based ~~introductory~~ physics <u>sequence</u>~~course~~ for majors in physical and mathematical sciences<u>. Topics include universal gravitation, elements of thermodynamics, fluid dynamics,</u>

including oscillatory motion, wave motion, sound waves, superposition and standing waves, electric field, Gauss's law, electric potential, and capacitance and dielectrics, current and resistance, DC circuits, magnetic fields, sources of magnetic fields.

Prerequisites: PHYS 110-4; or PHYS 100-4 with a grade of B or better
Co-requisites: MATH 101-3

S-202211.16
Proposed Revision of Calendar Entry – PHYS 110-4
Huber
That, on the recommendation of the Senate Committee on Academic Affairs, the change(s) to the course description for PHYS 110-4, Introductory Physics I: Mechanics on page 288 of the PDF 2022/23 undergraduate calendar, be approved as proposed.
Effective date: September 2023
CARRIED

PHYS 110-4 Introductory Physics I: Mechanics

This course is the first part of the calculus-based introductory physics sequence course for majors in physical and mathematical sciences. Topics include vectors, measurement, motion in one and two dimensions, the laws of motion, application of Newton's laws, work and energy, potential energy, conservation of energy, linear momentum and collisions, rotation of rigid bodies, rolling motion, angular momentum, static equilibrium, and elasticity, law of universal gravitation, and elements of thermodynamics.

Prerequisites: Physics 12 or PHYS 115-4, and Principles of Math 12 or Pre-calculus 12 or MATH 115-3
Co-requisites: MATH 100-3 or MATH 105-3

S-202211.17
Proposed Revision of Calendar Entry – PHYS 101-4
Huber
That, on the recommendation of the Senate Committee on Academic Affairs, the change(s) to the title and course description for PHYS 101-4, Introduction to Physics II on page 288 of the PDF 2022/23 undergraduate calendar, be approved as proposed.
Effective date: September 2023
CARRIED

PHYS 101-4 Introduction to Physics II Physics for Life Sciences II

This course is the sSecond part of an algebra-based introductory physics course sequence for majors in life and environmental sciences. Topics include oscillations and waves, sound, electric forces and fields, electrical energy and capacitance, current and resistance, direct-current circuits, magnetism, electromagnetic induction, reflection and refraction of light, mirrors and lenses, andCovers: electric charge, electric field, electric potential, DC circuits, magnetic field, sources of magnetic fields, magnetic induction, electromagnetic waves, geometrical optics, elements of modern physics.

Prerequisites: PHYS 100-4 or PHYS 110-4

S-202211.18
Proposed Revision of Calendar Entry – PHYS 100-4

Huber
That, on the recommendation of the Senate Committee on Academic Affairs, the change(s) to the title, course description and course prerequisite for PHYS 100-4, Introduction to Physics I on page 288 of the PDF 2022/23 undergraduate calendar, be approved as proposed.
Effective date: September 2023
CARRIED

PHYS 100-4 Introduction to Physics I Physics for Life Sciences I

This course is the first part of an algebra-based introductory physics course sequence for majors in life and environmental sciences. Topics include physics and measurement, motion in one and two dimensions, the laws of motion, applications of Newton's second laws of motion, work and energy, linear momentum and collisions, rotational motion and gravitation, rotational equilibrium and dynamics, fluids and solids, and elements of thermal physicsstatic equilibrium, elasticity, law of universal gravitation, laws of thermodynamics, fluid mechanics, and sound waves.

Prerequisites: Physics 11 or Physics 12 or PHYS 115-4

S-202211.19
Proposed Revision of Calendar Entry – PHYS 499-3
Huber
That, on the recommendation of the Senate Committee on Academic Affairs, the change(s) to the course description for PHYS 499-3, Advanced Topics in Physics on page 290 of the PDF 2022/23 undergraduate calendar, be approved as proposed.
Effective date: September 2023
CARRIED

PHYS 499-3 Advanced Topics in Physics

This course examines advanced ~~Topics include a selection of~~ topics ~~from~~ in contemporary p~~P~~hysics. Topics depend on instructor and student interest and normally focus on material not dealt with in other courses. This course may be repeated to a maximum of 6 credit hours if the material is substantially different ~~taken more than once for credit provided that different topics are covered~~.

Prerequisites: Permission of the instructor

S-202211.20
Proposed Revision of Calendar Entry – PHYS 410-3
Huber
That, on the recommendation of the Senate Committee on Academic Affairs, the change(s) to the course description for PHYS 410-3, Classical Electromagnetism II on page 290 of the PDF 2022/23 undergraduate calendar, be approved as proposed
Effective date: September 2023
CARRIED

PHYS 410-3 Classical Electromagnetism II

This is the s~~S~~econd part of a two-semester course in classical electromagnetism. Topics include conservation laws in electrodynamics~~:~~, electromagnetic wave equation, electromagnetic waves and their properties, wave polarization, electromagnetic waves in linear media and in conductors, wave guides, transmission lines, resonant cavities, electromagnetic potentials, ~~Faraday's induction law; inductance; Maxwell's equations; generation and propagation of electromagnetic waves; plane waves; spherical waves; reflection and refraction; wave guides;~~ electric dipole radiation~~;~~, magnetic dipole radiation, multipole radiation, radiation by a single charge,~~;~~ antennas, relativity, relativistic electrodynamics, four vectors, and relativistic formulation of Maxwell's equations.

Prerequisites: PHYS 310-3

S-202211.21
Proposed Revision of Calendar Entry – PHYS 400-3
Huber
That, on the recommendation of the Senate Committee on Academic Affairs, the change(s) to the course description for PHYS 400-3, Quantum Mechanics II on page 290 of the PDF 2022/23 undergraduate calendar, be approved as proposed.
Effective date: September 2023
CARRIED

PHYS 400-3 Quantum Mechanics II

This course is the second part of a two-semester course on quantum mechanics. In this second course, the following topics are covered: identical particles, Lagrangian and Hamiltonian formalisms, Lorentz force in quantum mechanics, symmetries, time-independent perturbation theory, variational methods, time-dependent perturbation theory, scattering processes, and quantum entanglement. ~~Continuation of Quantum Mechanics I. Covers: matrix formulation, perturbation theory, approximation methods, scattering theory, many-particle problems, identical particles, spin and statistics, atomic and molecular systems.~~

Prerequisites: PHYS 302-3

S-202211.22
Proposed Revision of Calendar Entry – PHYS 390-3
Huber
That, on the recommendation of the Senate Committee on Academic Affairs, the change(s) to the course description for PHYS 390-3, Advanced Physics Laboratory on page 290 of the PDF 2022/23

undergraduate calendar, be approved as proposed.
Effective date: September 2023
CARRIED

PHYS 390-3 Advanced Physics Laboratory

This is a course in aAdvanced laboratory methods involving experiments in a range of foundational areas of physics. Topics covered vary but include mechanics, thermodynamics, electromagnetism, solid state physics, optics and photonics, and atomic and nuclear physics.

Prerequisites: PHYS 202-4 and PHYS 206-4

S-202211.23
Proposed Revision of Calendar Entry – PHYS 206-4
Huber
That, on the recommendation of the Senate Committee on Academic Affairs, the change(s) to the course description for PHYS 206-4, Modern Physics II on page 289 of the PDF 2022/23 undergraduate calendar, be approved as proposed.
Effective date: September 2023
CARRIED

PHYS 206-4 Modern Physics II

This is the second part of a two-semester course in modern physics providing an introduction to introducing the theories of quantum mechanics and relativity and their applications. Topics include quantum mechanics in three dimensions, atomic structure and spectroscopy, Lorentz transformations, relativistic kinematics, relativistic dynamics, statistical physics and quantum statistics, molecular structure and spectroscopy, the solid state of matter, structure of crystals, semiconductors and superconductors, properties and nuclear structure of nuclei, radioactivity, nuclear reactions, applications of nuclear physics, and elementary particles, and elements of cosmology.

Prerequisites: PHYS 205-3

S-202211.24
Proposed Revision of Calendar Entry – PHYS 205-3
Huber
That, on the recommendation of the Senate Committee on Academic Affairs, the change(s) to the course description for PHYS 205-3, Modern Physics I on page 289 of the PDF 2022/23 undergraduate calendar, be approved as proposed.
Effective date: September 2023
CARRIED

PHYS 205-3 Modern Physics I

This is the first part of a two-semester course in modern physics providing an introduction to introducing the theories of relativity and quantum mechanics and their applications. Topics include Lorentz transformations, relativistic kinematics, relativistic dynamics, foundations of quantum theory, the quantum theory of light, the particle and wave nature of matter, wave function and the uncertainty principle, the Schrodinger equation in one and three dimensions, and tunneling phenomena, atomic structure and spectroscopy, and molecules and molecular spectroscopy.

Prerequisites: PHYS 111-4

S-202211.25
Proposed Revision of Calendar Entry – PHYS 409-3
Huber
That, on the recommendation of the Senate Committee on Academic Affairs, the change(s) to the course description for PHYS 409-3, Mathematical Methods in Physics on page 290 of the PDF 2022/23 undergraduate calendar, be approved as proposed.
Effective date: September 2023
CARRIED

PHYS 409-3 Mathematical Methods in Physics

This course surveys the methods and techniques involved in the mathematical description of physical systems. formulation and solutions of physics problems. Topics include matrix algebra and group theory, eigenvalue problems, differential equations, functions of a complex variable, Green's functions, special functions, Fourier series, integral equations, calculus of variations, and tensor analysis.

Prerequisites: Permission of the instructor

Precluded: MATH 409-3

S-202211.26
Proposed Revision of Calendar Entry - PHYS 406-3
Huber
That, on the recommendation of the Senate Committee on Academic Affairs, the change(s) to the course description for PHYS 406-3, Subatomic Physics on page 290 of the PDF 2022/23 undergraduate calendar, be approved as proposed.
Effective date: September 2023
CARRIED

PHYS 406-3 Subatomic Physics

This course is an introduction to the fields of nuclear and particle physics. Topics include ~~covers~~ properties and structure of nuclei, the shell model, radioactivity, nuclear reactions, fission and fusion, elementary particles and fundamental interactions, fermions, bosons, Feynman diagrams, quantum electrodynamics and the electromagnetic force, quarks and hadron spectroscopy, meson exchange potentials, color charge and quantum chromodynamics, the weak gauge bosons and the electroweak force, symmetries and conservation laws, and the standard model. ~~subatomic particles, symmetries and conservation laws, electromagnetic, weak, and hadronic interactions, beta decay, alpha decay, gamma decay, models of nuclear structure, nuclear reactions, fission, fusion, quarks and hadron spectroscopy.~~

Prerequisites: PHYS 206-4

S-202211.27
Proposed Revision of Calendar Entry – PHYS 402-(1-6)
Huber
That, on the recommendation of the Senate Committee on Academic Affairs, the change(s) to the course description for PHYS 402-(1-6), Physics Research Project on page 290 of the PDF 2022/23 undergraduate calendar, be approved as proposed.
Effective date: September 2023
CARRIED

PHYS 402-(1-6) Physics Research Project

This course requires students to conduct a project under the supervision of a faculty member. Students are normally required to submit a written report on the outcome of the project and deliver a presentation to the department. Project topics are usually chosen in an area of theoretical or experimental physics that matches the area of expertise of the faculty member supervising the student. ~~This is an experimental or theoretical research project conducted by the student under the supervision of a faculty member.~~ This course may be repeated to a maximum of 6 credit hours.

Prerequisites: Upper-division standing in a Physics d~~D~~egree and permission of the instructor

S-202211.28
Proposed Revision of Calendar Entry – PHYS 401-3
Huber
That, on the recommendation of the Senate Committee on Academic Affairs, the change(s) to the course description for PHYS 401-3, Seminar on Contemporary Topics in Physics on page 290 of the PDF 2022/23 undergraduate calendar, be approved as proposed.
Effective date: September 2023
CARRIED

PHYS 401-3 Seminar on Contemporary Topics in Physics

This is a seminar course designed to expose students to current active topics of research in various fields of physics and applied physics. The course revolves around seminar presentations given by invited speakers from UNBC and other research institutions, as well as presentations given by the students enrolled in the course. ~~Special topics from current areas of research in basic and applied physics.~~

Prerequisites: Permission of the instructor

S-202211.29
Proposed Revision of Calendar Entry – PHYS 351-3
Huber

That, on the recommendation of the Senate Committee on Academic Affairs, the change(s) to the course description for PHYS 351-3, Optics and Photonics I on page 290 of the PDF 2022/23 undergraduate calendar, be approved as proposed.
Effective date: September 2023
CARRIED

PHYS 351-3 Optics and Photonics I

This is an introductory course in g~~G~~eometrical and physical optics~~:~~. Topics include mathematics of wave motion, electromagnetic theory of light, photons, laws of geometrical optics, aberrations in optical systems, optical instruments, superposition of waves, interference, polarization, diffraction, ~~Fourier optics,~~ and elements of holography.

Prerequisites: PHYS 202-4
~~Precluded: PHYS 301-3~~

S-202211.30
Proposed Revision of Calendar Entry – PHYS 310-3
Huber
That, on the recommendation of the Senate Committee on Academic Affairs, the change(s) to the course description and course prerequisite for PHYS 310-3, Classical Electromagnetism I on page 290 of the PDF 2022/23 undergraduate calendar, be approved as proposed.
Effective date: September 2023
CARRIED

PHYS 310-3 Classical Electromagnetism I

This is the f~~F~~irst part of a two-semester course in classical electromagnetism. Topics include ~~electrodynamics:~~ the electric field and the scalar potential~~;~~, Coulomb's and Gauss's laws~~;~~, Poisson's and Laplace's equations~~;~~, boundary-value problems in electrostatics~~;~~, electric multipoles~~;~~, ~~electric~~ electrostatic energy and forces~~;~~, dielectric materials and continuity conditions~~;~~, the magnetic field and the vector potential~~;~~, Ampere's law~~;~~, magnetic fields in matter and magnetic materials~~;~~, magnetic energy and forces, Faraday's law and electromagnetic induction, electrodynamics, and Maxwell's equations.

Prerequisites: ~~MATH 201-3,~~ MATH 204-3 and PHYS 202-4

S-202211.31
Proposed Revision of Calendar Entry – PHYS 305-4
Huber
That, on the recommendation of the Senate Committee on Academic Affairs, the change(s) to the course description for PHYS 305-4, Electronics on page 289 of the PDF 2022/23 undergraduate calendar, be approved as proposed.
Effective date: September 2023
CARRIED

PHYS 305-4 Electronics

This course is an introductory electronics course for science majors. The course is offered in an integrated laboratory-lecture environment and requires an electronics design project. Topics include ~~Basics of electric and electronic circuits, including~~ DC circuits, Kirchhoff's laws, Thevenin's and Norton's theorems and equivalent circuit models, AC circuits and filters, ~~operational amplifiers,~~ diodes, transistors, operational amplifiers, feedback, and noise in electrical systems. ~~gates, combinational and sequential logic, filters, oscillators, control systems, digital circuits.~~

Prerequisites: ~~PHYS 111-4 and~~ PHYS 202-4 and PHYS 206-4, or permission of the instructor

S-202211.32
Proposed Revision of Calendar Entry – PHYS 302-3
Huber
That, on the recommendation of the Senate Committee on Academic Affairs, the change(s) to the course description for PHYS 302-3, Quantum Mechanics I on page 289 of the PDF 2022/23 undergraduate calendar, be approved as proposed.
Effective date: September 2023
CARRIED

PHYS 302-3 Quantum Mechanics I

This course is the first part of a two-semester course in quantum mechanics. Topics include quantum phenomena, the wave function and the Schrödinger equation, physical quantities and measurements, quantization of energy in simple systems, principles of quantum mechanics, commutation of observables, the Stern-Gerlach experiment, angular momentum, description of atoms, spin-1/2 and magnetic resonance, addition of angular momenta, and identical particles. ~~Breakdown of classical mechanics, wave packets, wave-particle duality, wave function and Schrodinger equation, eigenvalues and eigenfunctions, harmonic oscillator, potential wells, potential barriers, central force problems, hydrogen atom, spin and angular momentum, time dependence of quantum states.~~

Prerequisites: PHYS 205-3 and MATH 230-3
Precluded: CHEM 303-3

S-202211.33
Proposed Revision of Calendar Entry – PHYS 300-3
Huber
That, on the recommendation of the Senate Committee on Academic Affairs, the change(s) to the course description for PHYS 300-3, Classical Mechanics on page 289 of the PDF 2022/23 undergraduate calendar, be approved as proposed.
Effective date: September 2023
CARRIED

PHYS 300-3 Classical Mechanics

This course covers topics in aAnalytical ~~classical~~ mechanics~~,~~ including Newtonian mechanics, motion in non-inertial reference frames, calculus of variations, Lagrangian formalism~~dynamics~~, central force ~~central-force~~ motion, Hamiltonian formalism, canonical transformations, Hamilton-Jacobi theory, linear oscillators, and theory of small vibrations~~motion of rigid bodies, small oscillations, coupled oscillations, Hamiltonian dynamics~~.

Prerequisites: PHYS 111-4~~,~~and MATH 220-3

S-202211.34
Proposed Revision of Calendar Entry – PHYS 202-4
Huber
That, on the recommendation of the Senate Committee on Academic Affairs, the change(s) to the course description for PHYS 202-4, Electromagnetism and Optics on page 289 of the PDF 2022/23 undergraduate calendar, be approved as proposed.
Effective date: September 2023
CARRIED

PHYS 202-4 Electromagnetism and Optics

Topics in this course include Gauss's law, current and resistance, direct-current circuits, magnetic fields and forces, sources of magnetic fields, Faraday's law, inductance, alternating-current circuits, electromagnetic waves, the nature and propagation of light, geometric optics, and interference. ~~Magnetic field, Ampere's law, Faraday's law, inductance, magnetism and matter, electromagnetic oscillations, alternating currents, Maxwell's equations, electromagnetic waves, geometrical optics, interference, diffraction.~~

Prerequisites: PHYS 111-4
Co-requisites: MATH 20~~0~~2-3

S-202211.35
Proposed Revision of Calendar Entry – PHYS 200-3
Huber
That, on the recommendation of the Senate Committee on Academic Affairs, the change(s) to the course description for PHYS 200-3, Thermal Physics on page 289 of the PDF 2022/23 undergraduate calendar, be approved as proposed.
Effective date: September 2023
CARRIED

PHYS 200-3 Thermal Physics

This course covers t~~T~~hermodynamics and introductory statistical mechanics.~~.~~, Topics include ~~including~~ temperature, reversible processes and work, the first law of thermodynamics, the second law of thermodynamics, entropy, ~~thermodynamic potentials, change of phase, chemical potentials,~~ the third law of thermodynamics, ~~kinetic theory of gases~~ engines and refrigerators, free energy and chemical potential, phase transformations, and Boltzmann statistics.

Prerequisites: PHYS 111-4
Co-requisites: MATH 202-3

S-202211.36
Proposed Revision of Calendar Entry – PHYS 150-3
Huber
That, on the recommendation of the Senate Committee on Academic Affairs, the change(s) to the course description for PHYS 150-3, Physics for Future Leaders on page 289 of the PDF 2022/23 undergraduate calendar, be approved as proposed.
Effective date: September 2023
CARRIED

PHYS 150-3 Physics for Future Leaders

This course examines the physics and technology underlying ~~major technological aspects of~~ modern society and issues of global concern. ~~Through addressing themes such as global warming, the energy problem and alternative sources of energy, nuclear power and nuclear weapons, health and medical technology, pollution of the atmosphere, satellites, telecommunication, and the internet, this~~ The course introduces basic physics ~~topics~~ themes such as motion and energy, atoms and heat, gravity and force, electricity and magnetism, light and electromagnetic waves, and radioactivity and nuclear reactions~~, quantum physics, and relativity~~. Using these concepts, the course provides a basic scientific understanding of topics such as climate change, alternative energy, nuclear power and nuclear weapons, medical technology, atmospheric pollution, earthquakes, satellites, and telecommunication. This course requires no scientific or mathematical background and is accessible to students in any discipline.

Prerequisites: None

S-202211.37
Proposed Revision of Calendar Entry – PHYS 115-4
Huber
That, on the recommendation of the Senate Committee on Academic Affairs, the change(s) to the course description and course prerequisite for PHYS 115-4, General Introduction to Physics on page 289 of the PDF 2022/23 undergraduate calendar, be approved as proposed.
Effective date: September 2023
CARRIED

PHYS 115-4 General Introduction to Physics

This is an algebra-based introductory physics course for students without Grade 12 Physics. Topics include physics and measurement, motion in one and two dimensions, forces and Newton's ~~the~~ laws of motion ~~and their applications~~, circular motion, work and energy, electric forces and fields, electric potential, electric~~DC~~ circuits, and magnetic forces~~fields~~ and ~~magnetic~~ fields~~forces~~. Students with credit in Physics 12 require permission of the Program Chair.

~~Prerequisites: Students with credit in Physics 12 require permission of the Program Chair~~
Precluded: Physics 12 and PHYS 100-4

An Executive Summary – CHANGES TO BIOLOGY DEGREE AND ASSOCIATED CHANGES was included in the meeting package.

S-202211.38
Proposed Revision of Calendar Entry - BIOL B.Sc.
Huber
That, on the recommendation of the Senate Committee on Academic Affairs, the change(s) to the requirements to the 400-level of the Biology B.Sc. and to several specializations associated with the degree, on pages 61-62 (in the print or PDF calendar accessible on the UNBC web page) of the 2022/2023 undergraduate calendar, be approved as proposed.
Effective date: September 2022

CARRIED

400 Level

BIOL 410-3 ~~Population and Community Ecology~~

BIOL 411-3   Conservation Biology

One of the following:
BIOL 404-3   Plant Ecology
BIOL 406-3   Fish Ecology
BIOL 412-3   Wildlife Ecology

Subject Requirements

~~Fifteen~~ Eighteen additional credit hours chosen from the following, of which at least ~~6~~ 9 credit hours must be at the 400 level:

Any 300 or 400 level BIOL courses
ENSC 406-3   Environmental Modelling
FSTY 307-3   Disturbance Ecology and Forest Health

Additional Requirements

At least one course with Social Sciences content must be taken from the following list:

BIOL 304-3, BIOL 350-3, BIOL 420-3, or BIOL 421-3 (these may also count as Subject Requirements); or any course with the following prefixes: ANTH, COMM, ECON, EDUC, ENPL, ENVS, FNST, INTS, NORS, ORTM, POLS, or PSYC.

Elective Requirement

Elective credit hours must be taken as necessary to ensure completion of a minimum of 125 credit hours.

Biology BSc Areas of Specialization

Biology BSc students have the option to complete one Area of Specialization. Students must take five courses in an Area of Specialization. There is no limit to the number of courses taken within a specialization that may be used to fulfill both common biology requirements and specialization requirements. Students who are considering an Area of Specialization are strongly encouraged to talk to an advisor early in their second year in order to ensure that the prerequisites are met for upper-division courses.

Field Biology and Natural History

BIOL 301-3   Systematic Botany
BIOL 318-3   Fungi and Lichens

BIOL 333-3   Field School

(Students may substitute another biology-oriented field experience course for BIOL 333 at the discretion of the Chair)

Two of the following:

BIOL 302-3   Limnology
BIOL 304-3   Plants, Society, and the Environment
BIOL 315-3   Animal Diseases and Parasites
BIOL 322-3   Entomology
BIOL 350-3   Ethnobotany
BIOL 402-3   Aquatic Plants
BIOL 420-3   Animal Behaviour
BIOL 421-3   Insects, Fungi, and Society
ORTM 332-3   Outdoor, Environmental, and Experiential Education

Applied Ecology

BIOL 304-3   Plants, Society, and the Environment
BIOL 410-3   Population and Community Ecology
~~NREM 400-3   Natural Resources Planning~~
NREM 400-4   Natural Resources Planning

One of the following:

BIOL 404-3   Plant Ecology
BIOL 406-3   Fish Ecology
BIOL 412-3   Wildlife Ecology

~~Two~~ One of the following:

BIOL 350-3   Ethnobotany
BIOL 409-3   Conservation of Aquatic Ecosystems
BIOL 413-3   Wildlife Management
BIOL 414-3   Fisheries Management
BIOL 421-3   Insects, Fungi, and Society
ENSC 406-3   Environmental Modelling
FSTY 405-3   Forest Ecosystem Modelling
NREM 303-3   Aboriginal Perspectives on Land and Resource Management
NREM 306-3   Society, Policy, and Administration
NREM 409-3   Conservation Planning
ORTM 300-3   Recreation and Tourism Impacts
ORTM 400-3   Conservation Area Design and Management

Ecology and Evolution

BIOL 423-3	Molecular Evolution and Ecology

Two of the following:

BIOL 404-3	Plant Ecology
BIOL 406-3	Fish Ecology
BIOL 412-3	Wildlife Ecology

Two of the following:

BIOL 302-3	Limnology
BIOL 410-3	Population and Community Ecology
BIOL 420-3	Animal Behaviour
BIOL 425-3	Applied Genetics and Biotechnology
ENSC 406-3	Environmental Modelling
FSTY 307-3	Disturbance Ecology and Forest Health

Zoology

BIOL 307-3	Ichthyology and Herpetology
BIOL 308-3	Ornithology and Mammalogy
BIOL 321-3	Animal Physiology

Two of the following:

BIOL 350-3	Ethnobotany
BIOL 409-3	Conservation of Aquatic Ecosystems
BIOL 410-3	Population and Community Ecology
BIOL 413-3	Wildlife Management
BIOL 414-3	Fisheries Management
BIOL 421-3	Insects, Fungi, and Society

Botany and Mycology

BIOL 301-3	Systematic Botany
BIOL 318-3	Fungi and Lichens
BIOL 404-3	Plant Ecology

Two of the following:

BIOL 304-3	Plants, Society, and the Environment
BIOL 350-3	Ethnobotany
BIOL 402-3	Aquatic Plants
BIOL 410-3	Population and Community Ecology
BIOL 421-3	Insects, Fungi, and Society
FSTY 307-3	Disturbance Ecology and Forest Health

Cell Biology and Genetics

BCMB 306-3   Intermediary Metabolism
BIOL 312-3   Molecular Cell Physiology
BIOL 425-3   Applied Genetics and Biotechnology

Two of the following:
BCMB 340-3   Physical Biochemistry
BCMB 401-3   Basic Science of Oncology
BCMB 402-3   Macromolecular Structure
BCMB 403-3   Advanced Nucleic Acids
BCMB 404-3   Proteins and Enzymology
BIOL 321-3   Animal Physiology
BIOL 423-3   Molecular Evolution and Ecology

S-202211.39
Proposed Revision of Calendar Entry - BIOL
Huber
That, on the recommendation of the Senate Committee on Academic Affairs, the changes to the prerequisites for BIOL 411-3, on page 206 of the 2022/23 undergraduate calendar, be approved as proposed.
Effective date: September 2022
CARRIED

BIOL 411-3 Conservation Biology   This course provides a broad exposure to the theory and techniques necessary for understanding and preventing threats and declines to biological diversity. The science and application of conservation biology draw from a wide range of disciplines; thus, course and lab materials integrate perspectives from both the natural and social sciences. Students are advised to take this course in their final year of studies.

Prerequisites: <u>90 credit hours or permission of Chair,</u> BIOL 201-3

S-202211.40
Proposed Revision of Calendar Entry – BIOL
Huber
That, on the recommendation of the Senate Committee on Academic Affairs, the changes to the prerequisites for BIOL 409-3, on page 206 of the 2022/23 undergraduate calendar, be approved as proposed.
Effective date: September 2022
CARRIED

BIOL 409-3 Conservation of Aquatic Ecosystems   Aquatic ecosystems face many challenges requiring diverse conservation approaches. This course introduces students to the structure and functioning of aquatic ecosystems and exposes them to the myriad of conservation challenges being faced by these systems. Common approaches used to address conservation issues in aquatic ecosystems are presented and discussed using a series of case studies illustrating their successes and failures.

Prerequisites: BIOL 201-3
~~Prerequisites or co-requisites:~~ ~~BIOL 411-3~~

S-202211.41

Proposed Revision of Calendar Entry – ASTR 121-3
Huber
That, on the recommendation of the Senate Committee on Academic Affairs, the change(s) to the course description and course prerequisite for ASTR 121-3, Introduction to Astronomy II: The Universe on page 201 of the PDF 2022/23 undergraduate calendar, be approved as proposed.
Effective date: September 2023
CARRIED

ASTR 121-3 Introduction to Astronomy II: The Universe

This is an ~~one-semester~~ introductory course in astronomy ~~that is~~ general enough to be of interest to science and non-science majors with a proper background in mathematics. This course is complementary to ASTR 120-3. Topics include~~:~~ the origins of stars and planetary systems; the Sun; properties and structures of stars; stellar interiors; the evolution of stars; stellar remnants; white dwarfs; neutron stars; black holes, ~~worm holes and~~ warped spacetime; the Milky Way; the universe of galaxies; distance scales and indicators; active galaxies and quasars; and cosmology and astrobiology~~: past, present, and future of the universe, "Is 'Anyone' Out There?"~~. ASTR 121 and ASTR 120 may be taken in either order.

Prerequisites: Principles of Math 11 or Pre-calculus 11 or Foundations of Mathematics 11 or permission of the instructor

S-202211.42
Proposed Revision of Calendar Entry – ASTR 120-3
Huber
That, on the recommendation of the Senate Committee on Academic Affairs, the change(s) to the course description and course prerequisite for ASTR 120-3, Introduction to Astronomy I: The Solar System on page 201 of the PDF 2022/23 undergraduate calendar, be approved as proposed.
Effective date: September 2023
CARRIED

ASTR 120-3 Introduction to Astronomy I: The Solar System

This is an ~~one-semester~~ introductory course in Aastronomy that is general enough to be of interest to science and non-science majors with a proper background in mathematics. This course is complementary to ASTR 121-3. Topics include~~:~~ an overview of our solar system; the Sun; Earth and Moon; the inner planets~~: Mercury, Venus, and Mars~~; the gas giants~~: Jupiter, Saturn, Uranus, and Neptune;~~ and their ring structures and moons ~~and ring structure of the gas giants~~; Pluto and Charon; asteroids, comets, meteors, and meteorites; the origin and evolution of our solar system; the origin and evolution of the sSun; and other solar systems and exoplanets. ASTR 120 and ASTR 121 may be taken in either order.

Prerequisites: Principles of Math 11 or Pre-calculus 11 or Foundations of Mathematics 11 or permission of the instructor
Precluded: PHYS 120-3

S-202211.43
Proposed Revision of Calendar Entry – HHSC 105
Huber
That, on the recommendation of the Senate Committee on Academic Affairs, the change(s) to the prerequisites for HHSC105 be approved as proposed.
Effective date: September 2023
CARRIED

HHSC 105-3 Functional Anatomy The purpose of this course is to provide a macroscopic examination of the human body. Lecture topics include musculoskeletal system and mobility, and major organ systems including cardiovascular, digestive and neurological, with emphasis on how these systems integrate for body function. A laboratory component is included. This course is appropriate for students who intend to enter health profession fields. Prerequisites: Biology 12 and Chemistry 11 **or Chemistry 12 or equivalent.**

11.3	**Steering Committee of Senate**	**Payne**
11.4	**Senate Committee on Nominations**	**Zogas**

S-202211.44
Recommendation of Senate Committee Members to Senate
That, on the recommendation of the Senate Committee on Nominations, the following candidates, who have met all eligibility requirements to serve on Senate committees as indicated, be appointed as proposed.
Effective date: November 23, 2022

For Approval Items:

SENATE COMMITTEE POSITION TO BE FILLED   **CANDIDATE**
(except as otherwise noted, all terms begin immediately)

For Information Items:

Senate Committee Vacancies

COMMITTEE	POSITION	TERM EXPIRY DATE
SCS	Lay Senator	03/31/2024
SCN	Faculty Senator	03/31/2023
	Lay Senator	03/31/2024
SCCC	Student Senator	08/31/2023
SCAAf	Faculty Senator	03/31/2024
	Faculty Member	03/31/2023
	Faculty Member	03/31/2024
	Graduate Student	08/31/2023
SCII	Indigenous Undergraduate Student	08/31/2023
SCSB	Undergraduate Student	08/31/2023
SCUB	Graduate Student	08/31/2023
	Undergraduate Student	08/31/2023
SCA	Graduate Student Senator	08/31/2023
	Student at Large	08/31/2023

11.5   Senate Committee on Curriculum and Calendar   **Hawes**

Associate Registrar Hawes reported that the committee has welcomed new members and will be looking to appoint a new Chair for January.

11.6   Senate Committee on Admissions and Degrees   **Read**
No report

11.7   Senate Committee on Indigenous Initiatives   **Payne**

The President reported that he will be meeting with the committee in January. Associate Vice President Litt has been overseeing the Indigenous Initiatives portfolio on an interim basis, but they will be moving forward adding a leadership position in January.

11.8   Senate Committee on Honorary Degrees and Special Forms of Recognition   **Payne**

The President reported that the committee will be meeting in early December to review Honorary Degree and Professor Emeriti nominations.

11.9   Senate Committee on Scholarships and Bursaries   **Lewis**

Vice President Lewis reported that some additional awards have been approved but are being held until they are reviewed by the Senate Committee on Indigenous Initiatives.

For Information

SCSB20221026.03 *(approved)*
Prkachin Award to Support Advanced Study in Psychology
That the revised Terms and Conditions for the Prkachin Award to Support Advanced Study in Psychology be approved.
Effective: 2023-2024 Academic Year

SCSB20221026.04 *(approved)*
Ricci Dalton Award
That the revised Terms and Conditions for the Ricci Dalton Award be approved.
Effective: 2023-2024 Academic Year

11.10   Senate Committee on University Budget   **Gehloff**
No report

12.0   Information
None

13.0   Other Business
None

14.0   S-202211.45
Move to the Closed Session
Hofsink
That the meeting move to Close Session.
CARRIED

15.0   S-202211.49
Adjournment
Whitcombe
That the Senate meeting be adjourned.
CARRIED

The meeting adjourned at 5pm.