

CENTRAL WASHINGTON UNIVERSITY
FACULTY SENATE

REGULAR MEETING
Wednesday, March 06, 2013, 3:10 p.m.
BARGE 412
Minutes

Meeting was called to order at 3:11 p.m.

Senators: All senators or their alternates were present except: Boris Kovalerchuk, Robert Pritchett, Sathy Rajendran, David Rawlinson, Stephen Robison, Teresa Sloan, Matthew Wilson, Dale Wright

Visitors: Chris Schedler, Kirk Johnson, Jeff Snedeker, Lene Pedersen, Steve Wagner

CHANGES TO AND APPROVAL OF AGENDA - None

MOTION NO. 12-18(Approved): APPROVAL OF MINUTES of February 6, 2013

COMMUNICATIONS - None

FACULTY ISSUES: Senator Lipori shared a concern about students regularly missing their final exams each quarter due to conferences, athletics, etc. The University does have a policy regarding this and indicates that these types of absences should be avoided if at all possible during finals week. Senator Spybrook asked for clarification about the Library committee only asking for full professors. Chair Madlem clarified that this is the Library's college personnel committee and needs to be made up of faculty at or above the rank of the faculty they are reviewing.

Canvas Learning Management System – Chris Schedler handed out a one page briefing sheet with background information on the evaluation of the Canvas learning management system. The University currently uses BlackBoard. April of last year the community and technical colleges did an RFP for a learning management system. Chris was on this committee and this group decided to go with Canvas. When they wrote the contract it included the possibility that all four years institutions could be part of it as well. UW, Western and Eastern have all moved to Canvas. Newly formed ATAC Committee asked the faculty representatives from that committee, as well as multi-modal faculty, to review the two learning management systems side-by-side. The evaluation rubric is available. They will be starting a small scale pilot in spring quarter from all colleges and centers. They will be including 25 faculty in this spring pilot. They currently have about 13-14 faculty, so if anyone is interesting in piloting canvas this spring please let Chris know. Chris will be doing focus groups and training with faculty as well as surveying students in these courses. There will also be a summer pilot and these will continue through the end of next spring. If the University decides to make Canvas the main learning management system, we would migrate hopefully in spring 2014.

CHCI – Kirk Johnson gave a presentation regarding the Chimpanzee and Human Communication Institute (CHCI). Due to some recent passing of several of the chimpanzees it has left Tatu and Luolis as the only two chimpanzees currently at the Institute. This is not an appropriate number of individuals to keep in one location. They have been looking at several different options and are

looking for feedback to provide to the President's cabinet for a final decision. The first option is to maintain CHCI as a research institute. The second is to consider what is best for the chimpanzees. One possibility is to transition the current population to a new location. Another would be to restore the current population to five individuals. The Friends of Washoe provide for feeding of the animals and the University provides funding for the facility. If the current population were to be transitioned to a new location, it would allow current faculty and graduate students to focus on classroom teaching, rather than animal husbandry. There is a tremendous amount of research film and notes that have not been analyzed that could become a priority. There are cons to this as a lot of people rely on the current CHCI tourist activity and it brings positive press for CWU. Transitioning the chimpanzees would require CHCI to revise the current instruction and curriculum. There would not be an instantaneous lab on campus and the Institute currently brings students to our campus. The chimpanzees would experience stress to move them to a new facility. If we bring in more animals it would require substantial renovation. However, it continues goodwill, tourism, outreach for the community and continued graduate and undergraduate experiences. If you would like to provide feedback please contact Kirk Johnson at johnsonk@cwu.edu or Linda Schactler at schactler@cwu.edu.

PRESIDENT: President Gaudino reported that Professor Mike Jackson received a very prestigious physics teacher's award. He received the David Halliday and Robert Resnick Award for Excellence in Undergraduate Physics Teaching. March 22 and 23 Central will be hosting First a science and technology program. This is a high school competition using robotics. President Gaudino expressed appreciation to Melody Madlem who has agreed to serve as the Strategic Planning Initiatives coordinator. This is a half-time administrative position filled by a faculty member. The President indicated that nothing is clear regarding budget in Olympia yet. It appears that Governor Inslee is not going to put forward his own budget. The next economic forecast comes out in April. The Senate budget should be out about a week after the forecast and the House sometime the first week of April. One concern is they will put in controls on the ability of institutions to increase tuition. Performance measures may have incentives or consequences attached to them. So far there has been positive feedback on Science II construction. On the Federal level Central will cover the Education Opportunity Grants that were recently cut. That will be about \$15,000. It is possible CAMP/TRIO could receive funding cuts upwards of \$145,000. President Gaudino indicated that the University would try and find a way to continue the funding internally if that happens. Currently it does not look like the Pell grants will be affected by the cuts. The policy on light snack refreshments for ligament university business has been changed to be less restrictive. Central refinanced the construction bonds that had been issued for construction of the SURC and residence halls yesterday. Reduced the interest and will save Central \$10.8 million in interest over the course of 20 year bonds.

OLD BUSINESS - None

REPORTS/ACTION ITEMS

SENATE COMMITTEES:

Bylaws & Academic Code Committee

Motion No. 12-12 (Approve with 1 abstention): Approve the renaming of the "*Academic Code*" to the "*Faculty Code*". See Exhibit A.

Motion No. 12-19(First reading of two): Approve adding the Director of Academic Planning as an ex-officio member to Faculty Senate Bylaws Section IV-A.3 a. Curriculum Committee and c. General Education Committee as shown in Exhibit B.

General Education

Motion No 12-20(Tabled): Approve the General Education proposal as outlined in Exhibit C.

Motion 12-21(Failed): Senator Haniuck moved to extend discussion until 4:55 p.m. Motion was seconded and failed.

Motion 12-22(Approved): Senator Jim Johnson moved to table Motion No. 12-20. Motion seconded and approved.

Evaluation & Assessment Committee – Evaluation and Assessment Committee has been working with administrators to provide information and input on the revised evaluation instrument. The committee has received responses from all administrators. The committee also invited input from faculty and received a few responses. The committee will administer the Faculty Assessment of Academic Administrators from April 8 to May 8. The committee is continuing with the Office of Assessment on the SEOI process. There is a SEOI poll and discussion on GoCentral, and hope to have continued faculty feedback. The committee has submitted the Senate and Senate Executive Committee evaluation instruments to the Executive Committee for their review and is awaiting their feedback. The committee has received a formal charge to take a new look at the evaluation of teaching, and we will begin a study this Spring.

Faculty Legislative Representative – There are several bills that have passed out of the originating committees and are still in play during this session. Those noteworthy include: HB 1011-removes one year waiting period for active members and former members of the US military for purposes of resident-tuition status; HB1544/SB5559-Authorizing Educational Specialist degrees (Ed.S.) (School Psychology at CWU); HB 1322/SB 5195-Changing state need grant eligibility for state recognized non-profit institutions (Western Governors University students would be eligible for SNG); SHB 1624-Concerns limiting tuition authority at the 6 public baccalaureate institutions, as well as creating a task force to review and provide input on the tuition/state-funding relationship. This bill has been heard in the House Appropriations; HB 1817-adds two new categories of eligible students for the State Need Grant; permits students who have been granted Deferred Action for Childhood Arrival status by the United States Citizenship and Immigration Services to be eligible for SNG and permits students who qualify under the fifth category of the resident student definition to be eligible. On February 18th Mike Jackson, Kirk Johnson, Bruce Palmquist and several CWU students made the legislative rounds, meeting with senators and representatives regarding the much-needed Science II project. The overall atmosphere in Olympia for higher education is positive.

CHAIR: Chair Madlem reported on her meetings with Senators. She and Chair-Elect Cheney have been getting an incredible amount of information. They should be finished with the meetings by the end of finals week. One theme that is emerging is that faculty needs some space to call their own. Distinguished Faculty selections are progressing. Dr. Ian Quitadomo has agreed to be the CASE Professor of the Year nominee for Central.

CHAIR-ELECT: Chair-Elect Cheney indicated it has been a pleasure to meet Senators and look forward to meeting those we haven't seen so far.

STUDENT REPORT: Brian reported that the student Q2S survey indicated that 87% of the students surveyed did not want to switch to the semester system. Approximately 500 students were surveyed. The students will be presenting their findings at the April Senate meeting.

Students have been supporting a military bill that would give instate tuition for all veterans. Student Academic Senate is working with Jesse Nelson on graduation numbers and time-to-graduation and what can be done to help boost or maintain the current numbers. They are working on getting GoCentral for students up and running. They will be doing surveys on General Education and online learning.

NEW BUSINESS – Senator Olson asked that when Senate discussed the General Education proposal that everybody limit comments, questions and responses to short amounts of time and not rehash the same comments.

Steve Wagner, Director of Primate Behavior and Ecology expressed concern about not being able to respond to the CHCI presentation by Dean Johnson. They currently have 24 graduate students. Eliminating CHCI would create difficulties with enrollments and curriculum. It is really important for students to do research on live animals. CHCI is recognized nationally and internationally. There are only three other primate behavior programs in the world. Large numbers of graduates go on to other master and doctoral programs. Since 2008 there have been 48,000 visitors to CHCI. Lene Pedersen, Anthropology Interim Chair, indicated Central is modeling great stewardship and care of the animals and non-intrusive research.

Faculty Senate will take a Sense of the Senate vote at the April 3rd meeting on the two options presented regarding CHCI.

Meeting was adjourned at 5:10 p.m.

Exhibit A

The BAAC wishes to propose that the “Academic Code” be re-titled the “Faculty Code”.

Such a change would actually return the Code to something closer to its former (pre-CBA) title, when it was known as the “Faculty Code of Personnel Policy and Procedure”.

While the historical fact in itself is perhaps not a reason for changing the title, we also see two substantive reasons in favor of the change, as follows:

- (1) The phrase “Academic Code” is often used (albeit informally) to refer to other policies, such as the Student Code of Conduct. Changing the title of the Academic Code to “Faculty Code” would remove such confusion.
- (2) We feel that “Faculty Code” is more descriptively apt than “Academic Code”. This in itself is for two reasons:
 - (a) In one way “Academic Code” is too *broad*. The Code specifically concerns faculty matters. The term “academic” does not convey that specificity, for it is commonly also applied to student matters. (This is obviously related to point (1).)
 - (b) In another way “Academic Code” is too *narrow*. The word “academic” connotes scholarly matters, yet the Code concerns not just scholarly matters but also administrative procedure: for example, the election of department chairs, and the composition and running of the Senate.

Exhibit B

Propose the following changes to the Bylaws, Section IV-A-3:

- a. The Faculty Senate Curriculum Committee shall be concerned with the study, development, and improvement of the curriculum, educational programs, and academic policy (section 5-10 of the CWU Policies manual, Curriculum Policies and Procedures) of at the university, shall cooperate with other individuals, groups or committees at the university in carrying out its duties, and shall do such other things as may be requested by or approved by the Senate Executive Committee. The membership of the Curriculum Committee shall consist of:
 1. two (2) faculty from each college,
 2. one (1) faculty from the Library,
 3. one (1) student selected by ASCWU, and
 4. the Director of Academic Planning, ex-officio, non-voting

- c. The General Education Committee shall be concerned with the study, development, and improvement of the General Education Program. The committee shall review and recommend courses, programs and policies of general education in close cooperation with appropriate academic administrators. It shall perform other duties as may be requested by or approved by the Senate Executive Committee. The membership of the General Education Committee shall consist of:
 1. two (2) faculty from each college with the exception of the Library,
 2. one (1) student selected by ASCWU, and
 - ~~3. one (1) ex-officio, non-voting representative of the Provost~~
 3. the Director of Academic Planning, ex-officio, non-voting

Exhibit C

INTEGRATED PROPOSAL FOR ALTERATIONS TO THE CURRENT SET OF CWU GENERAL EDUCATION REQUIREMENTS.

Basic Skills Requirements.

Academic Advising Seminar:

Learner Outcomes. Students will be able to:

1. Describe CWU students' rights and responsibilities, classroom expectations, and the importance of taking ownership of one's education.
2. Reflect on their own experiences that influenced their decision to attend the university and identify their anticipated needs for success.
3. Demonstrate knowledge and use of academic resources at CWU.
4. Explain CWU's general education requirements, graduation requirements, the process of declaring a major/minor, and the purpose of a liberal arts education.
5. Illustrate basic understanding of CWU library information resources.
6. Show the ability to access and utilize CWU web resources, such as GroupWise, Blackboard, and SAFARI.
7. Recognize the importance of extra-curricular opportunities to enhance your college experience.

Basic Academic Writing: (a minimum grade of C- is required in Basic Academic Writing before taking Academic Writing and the Research Paper or any Writing intensive (W) course)

Learner Outcomes. Students will be able to:

1. Read critically, distinguishing central ideas from evidence; identifying the author's purpose, assumptions, and attitudes; and using prior knowledge and experience to identify issues.
2. Respond appropriately to different kinds of rhetorical situations by considering the relevant context, focusing on a purpose, and addressing a specific audience.
3. Synthesize responses to common issues, various perspectives on a topic, or solutions to a problem and draw reasonable conclusions based on this synthesis.
4. Express ideas in clear, coherent, and balanced sentences and paragraphs.
5. Demonstrate the ability to follow the conventions of standard Academic English, demonstrating control of grammar, usage, and punctuation rules.

Academic Writing and the Research Paper:

Learner Outcomes. Students will be able to:

1. Identify assumptions and criteria to use when analyzing the writing of others.
2. Take a position on an issue by developing a focused assertion based on a shared assumption, presenting evidence in support of a line of reasoning, addressing divergent stances on the issue, and using a variety of research methods.
3. Prepare and implement a research plan that outlines the quantity and quality of sources needed and the use of a variety of research methods. Use the internet to find specific sites and information.
4. Cite and document sources precisely and effectively, noting the connection between form and citation and/or documentation and rhetorical impact.
5. Describe the interrelationship between style and meaning in the writing of others and adjust style to enhance meaning in their own writing.
6. Demonstrate proficiency in the conventions of standard Academic English, demonstrating control of grammar, usage, and punctuation rules.

Computer Fundamentals:

Learner Outcomes. Students will be able to:

1. Create documents using word processing software.
2. Create spreadsheets using a spreadsheet application.
3. Create a computer based presentation using presentation software.
4. Extract information from a database using database software.

Rationale: These are computer skills that are used by students in many General Education courses. Many majors and professions will also require these skills.

Foreign Language Requirement: Required—2 years of one high school foreign language or 1 year of college-

Learner Outcomes. Students will be able to:

1. Demonstrate comprehension of common structures and everyday vocabulary in spoken and written forms of the target language.
2. Demonstrate production of common structures and everyday vocabulary in spoken and written forms of the target language.
3. Demonstrate knowledge of the most common cultural features of the country or countries in which the target language is spoken.

Basic Quantitative Skills: Students must pass a Basic Quantitative Skills course or achieve a minimum established score on a Quantitative Literacy Assessment Exam to fulfill the Basic Quantitative Skills requirement) Goal: Develop the basic tools necessary for quantitative literacy.

Learner Outcomes. Students will be able to:

1. Use proportional reasoning to solve and analyze problems involving “per unit” quantities, indices and percentages.
2. Analyze, interpret and solve problems related to personal finance.
3. Interpret percentages, fractions and ratios as appropriate probabilities.
4. Use probability to analyze risks and their portrayal in the media.
5. Create and interpret basic statistical summaries.
6. Compare and contrast the behavior of various growth models.

Rationale: That our students “need” mathematics is a common assertion. What remains unclear, however, is what type of math they need. Do all students need the algebra skills necessary to succeed in calculus? Should every college-educated citizen be able to use the quadratic formula to solve quadratic equations? Or would our society and students be better served by understanding conditional probability? Or being able to read and comment critically on an article on the ramifications of changing the retirement age? Or understanding that the plural of anecdote is not data? The committee feels that this second type of math, often called quantitative literacy, is a more valuable skill for all students, and as a result, the committee feels that our students are better served by either taking a course in basic quantitative literacy skills or by passing a quantitative literacy test.

Quantitative Literacy course requirement: Note: Students are urged to take a quantitative literacy (Q) class that is also a breadth requirement course or a quantitative literacy (Q) course in their selected major. Goal: Apply the concepts and tools of Basic Quantitative Skills in context.

Learner Outcomes. Students will be able to:

1. Read, interpret and generate graphical representations of relevant data.
2. In context, describe the uses and limitations of statistical data.
3. Analyze and critique claims involving quantitative data.

4. Interpret and explain quantitative relationships expressed in symbols.

Rationale: In addition to the basic skills, students need to use quantitative literacy in context. It is in these contexts that these important skills are truly learned. As a result, all students should take a class where the basic skills are practiced in context.

Critical Thinking course requirement: Goal: Be able to analyze arguments and their constituent parts, as well as be aware of the assumptions one makes in an argument.

Learner Outcomes: Students will be able to:

1. Accurately summarize an argument, identifying its thesis, premises, and assumptions.
2. State the general distinction between the truth of an argument's premises and the validity or strength of its reasoning; and display awareness of this in their writing.
3. Identify whether a given argument is deductive or inductive, and accordingly evaluate it for either validity or soundness of the strength and cogency; and recognize whether it commits any common argumentative fallacies.
4. Display awareness of their own assumptions, and a willingness to question them; and hence an ability and willingness to engage seriously and respectfully with others who disagree with those assumptions.
5. Show awareness and tolerance of complexity; that is, be able to take a reasoned position on a complex question while acknowledging that their position might be incorrect.

Rationale: The committee feels that the current reasoning requirement should be split apart into two components: a quantitative literacy requirement and a critical thinking requirement.

- a. Quantitative Literacy is best learned in context, and as a result, such classes should not be the sole responsibility of the math department. Quantitatively literate students are prepared to analyze arguments involving quantitative claims. Thus, requiring such a course in the General Education program ensures that our students will be well-prepared, thoughtful citizens.
- b. Critical Thinking. In addition to analyzing arguments involving quantitative claims, students need to be able to analyze more general arguments. As a result, the committee feels that a course in critical thinking, involving analysis of the logical structure of arguments, is necessary. One of the goals of such a class is to make students aware of the distinction between facts and assumptions.

Writing Requirement: Note: Students are urged to take a writing intensive (W) class that is also a breadth requirement course or a writing intensive (W) course in their selected major.

1. Require Basic Academic Writing (a minimum grade of C-) as a prerequisite for general education writing intensive (W) courses.
2. Require three (3) writing intensive (W) courses in the General Education program for graduation.
 - a. Writing intensive courses must include at least seven pages of assigned writing that is assessed for content and mechanics (grammar, spelling, punctuation, and organization).
3. Departments will complete an assessment of student writing in the major. Note: The means by which students' writing in their major courses is assessed is to be determined by the departments and approved by the General Education Committee and may be specific to individual majors.

Possible assessment models include:

- a. Compilation of a portfolio of student writing to be included in a student's end of the major assessment.
- b. Create or commission a "writing in the major" course that teaches and assesses the type/forms of writing used specifically in the major.
- c. Establish designed writing intensive courses in the major, similar to those in the General Education Program, in which writing is a significant aspect of the courses' learning outcomes and assessment.

Explanation and Rationale for changes to the Writing Requirement:

Part 1: Basic Academic Writing will become a prerequisite to all writing intensive (W) courses.

Rationale:

- CWU puts itself at a disadvantage by assessing student writing (for NWCCU and other accrediting organizations) in writing intensive courses which students take before they have completed Basic Academic Writing and Academic Writing and the Research Paper.
- Writing intensive (W) courses are intended to reinforce skills learned in Basic Academic Writing and Academic Writing and the Research Paper. According to Scott Carlton, Interim Registrar and former Director of Academic Advising Services, to require both Basic Academic Writing and Academic Writing and the Research Paper as prerequisites to all writing intensive courses would create a significant logjam for students trying to complete their coursework in four years.
- Although requiring Basic Academic Writing as a prerequisite to all writing intensive (W) courses will create some problems in students' progress to degree, we believe those problems will be mitigated by the second part of the proposal.

Part 2: The number of writing intensive (W) courses in General Education will be reduced from four (4) to three (3).

Rationale:

- The writing intensive (W) course requirement was established for the purpose of reinforcing skills learned in college-level composition courses, to ensure that students write on a regular basis in their general education courses, and to assist in the institutional assessment of writing in the General Education Program.
- The reduction in the number of required writing intensive (W) courses is intended to alleviate the logjam created by requiring Basic Academic Writing as a prerequisite to all writing intensive courses.
- However, the reduction in writing intensive courses runs counter to the expressed intentions of the writing intensive (W) course requirement. The solution proposed to this reduction is outlined in Part 3 of the proposal.

Part 3: Establishes a graduation requirement that all departments will complete an assessment of student writing in their majors.

Explanation:

- The means by which students writing in their major courses is assessed is to be determined by the departments and approved by the General Education Committee and may be specific to individual majors.
- One possible assessment model that might be used is the compilation of a portfolio of student writing to be included in a student's end of the major assessment.
- Using another model, departments may also choose to create or commission a "writing in the major" course that teaches and assesses the type/forms of writing used specifically in the major. e.g. A Public Relations major would be expected to produce press releases, reports, etc. while a chemistry major might be expected to produce lab reports, experiment proposals, research papers, etc.
- A third might be establishing designated writing intensive courses in the major, similar to those in the General Education Program, in which writing is a significant aspect of the courses' learning outcomes and assessment. These courses would be most effective if they were required for all majors and include a designated writing outcome and assessment so that all instructors of the course would be required to fulfill the requirement. In this way, students could be assured of the experience of discipline/major-based writing no matter who taught the course.

Rationale:

- The additional graduation requirement would compensate for the elimination of one writing intensive course in general education.
- It would also assist students in becoming more literate in their chosen careers. In past alumni surveys, students were asked about things they wished they had learned more about or had more experience with. Many students listed writing in their major and stated that they felt inadequately prepared for writing in their chosen career field.
- Additionally, the university has frequently expressed a belief in the significance of “teaching writing across the curriculum.” The addition of this graduation requirement would demonstrate the university’s commitment to this important educational goal.

Proposing courses for the basic or breadth areas:

If a department wishes to propose a course for a basic skill or breadth area, department must:

1. Identify the block for the proposed course.
2. Describe in detail how the primary learner outcomes of the course meet the general education learner outcomes identified for that block.
3. Provide a detailed sample syllabus that highlights sections that will be common to all syllabi used for this course.
4. Provide documentation for the ways in which the learner outcomes will be assessed.

Note: Individual courses may include additional learner outcomes specific to the course, but must include as their primary learner outcomes those associated with the basic or breadth area under which the course is located.

BREADTH AREAS

SOCIAL AND BEHAVIORAL SCIENCES GENERAL EDUCATION

Perspectives on the Cultures and Experiences of the United States.

Learner Outcomes. Students will be able to:

1. Identify the influence of the various institutions, cultures and traditions of the United States.
2. Critically analyze ways in which the past affects the present and future.
3. Articulate the requirements of informed citizenship based on analysis of social, economic and/or political processes issues and events.
4. Apply critical thinking and ethical reasoning to individual and collective decision making.

Perspectives on World Cultures.

Learner Outcomes. Students will be able to:

1. Identify the influence of the various institutions, cultures and traditions of nations, groups or societies outside the United States.
2. Critically analyze the dimensions of human diversity and similarity within and outside the United States.
3. Articulate contemporary national and transnational issues that provide perspective on one's relationship to world cultures.
4. Apply critical thinking and ethical reasoning to individual and collective decision making.

Foundations of Human Adaptations and Behavior.

Learner Outcomes. Students will be able to:

1. Identify basic principles which underlie human interaction.

2. Critically analyze the fundamental patterns of human interaction with natural and man-made environments.
3. Articulate ways in which we can foster a better understanding of the human condition by analyzing the informed judgments of how humans interact with their immediate and distal environments.
4. Explain and apply scientific methods to investigate and analyze individual, groups or institutional behavior.

ARTS AND HUMANITIES GENERAL EDUCATION

Literature and the Humanities.

Learner Outcomes. Students will be able to:

1. Read and respond in oral and written forms to literary works from a variety of cultures.
2. Examine artifacts with an awareness of the cultural context in which they were produced.
3. Read and respond in oral and written forms to literary works of different genres.
4. Synthesize one's understanding of past humanistic knowledge with one's current knowledge, making connections between past and present.

The Aesthetic Experience.

Learner Outcomes. Students will be able to:

1. Acquire a vocabulary for the discussion of aesthetic genres.
2. Demonstrate an understanding of aesthetic activities within their historical, artistic, and cultural traditions.
3. Demonstrate an understanding of several artistic genres and how they relate to one another.
4. Apply aesthetic judgment and critical thinking by experiencing and evaluating works of art.

Religions and Philosophies of the World.

Learner Outcomes. Students will be able to:

1. Identify their own linguistic, conceptual and normative presuppositions.
2. Analyze alternative ways of articulating and interpreting human experience.
3. Reflect on the implications of these frameworks in the wider social and political sphere.
4. Integrate unfamiliar vocabularies, principles, and systems of thought into their existing ideas.
5. Critically evaluate their use of language, perception of reality, and values.

NATURAL SCIENCES GENERAL EDUCATION

Learner Outcomes for all Natural Sciences general education courses. Students will be able to:

1. Demonstrate how scientific discovery and research contribute to our lives.
2. Recognize the natural sciences as a system in which observations and measurement must ultimately verify theories that explain and predict natural phenomena.
3. Distinguish between data and analysis.
4. Apply mathematical and quantitative skills to solve problems in the natural sciences.
5. Engage in systematic critical thinking (analysis, inference, evaluation, induction, deduction).

In addition, each of the following breadth areas also has specific learner outcomes:

Fundamental Disciplines of Physical and Biological Sciences

Learner Outcomes. Students will be able to:

1. Make inquiry-driven laboratory and/or field observations.
2. Rigorously describe and analyze fundamental processes and components of one or more natural systems.

Patterns and Connections in the Natural World

Learner Outcomes. Students will be able to:

1. Demonstrate an understanding of conceptual models of complex natural systems.

2. Analyze the processes and cause-effect relationships in complex natural systems.

Application to Natural Sciences

Learner Outcomes. Students will be able to:

1. Articulate the scientific or technological basis of real-world issues.
2. Use scientific data and method to accurately describe or predict consequences of technology on natural systems.
3. Make informed decisions about real-world issues based on an understanding of the underlying science.
4. Apply scientific principles to real-world issues.