**BIOL 450 Mycology Course Creation Supporting Information**

Prepared by Brian Compton for presentation at the 2/18/18 Science Department Meeting (Part 1), updated on 2/26/18 based on feedback from the Science Department (Part 2), and updated on 4/2/18 regarding further revisions for presentation as a second reading (Part 3).

**Part 1**

**Rationale:**

BIOL 388 Mycology was successfully presented during the Fall 2017 Quarter to four students, including one who participated in the course as part of an individualized studies course in ethnomycology. Special Topics courses are intended for one-time offerings only, hence this proposal to create a permanent course with the recommended course subject code and number BIOL 450. The 400-level is recommended based on the unique character of the mycological content (i.e., mycology involves many new concepts, terms, and taxonomic names that students will not have learned previously in any other course at NWIC due to the unique character of fungi as reflected by their current placement in their own kingdom, i.e., Fungi) and reflects how the subject has been or is presented at several universities in Washington, e.g., BIOL 497 Mycology at Western Washington University (by Eric DeChaine), BIOL 440 General Mycology at the University of Washington (by Joe Ammirati), and PL\_P [Plant Pathology] 521 General Mycology at Washington State University Pullman (by Lori Carris). Other mycology courses are offered within Washington, e.g., on the topics of plant pathology, food mycology, and advanced fungal biology. I reviewed the catalogs of all the tribal colleges and universities (TCUs) that are members of AIHEC but did not find evidence of any similar course in those catalogs to help guide the course development process; fungi are only minimally referenced in terms of general biology, general botany, biological diversity, genetics, microbiology, forestry, or health science courses in some TCU catalogs.

**Course Outcomes:**

The course outcomes were developed based on comparison with the aforementioned other mycology courses offered elsewhere and with a view to providing students with the opportunity to explore mycological topics as related to traditional Indigenous knowledge and experience. Emphasis is on local funga, including the importance of fungi to environmental considerations and human affairs, and to support the collection and identification of numerous local fungi. In the Fall 2017 Quarter, students in BIOL 388 Mycology worked collaboratively to identify approximately 30 taxa of local fungi, and also produced an exhibit of their collections with additional descriptive materials, which is currently on display in Building 16.

**Course Texts:**

BIOL 388 Mycology included Kendrick's (2017) *The Fifth Kingdom: An Introduction to Mycology*. BIOL 450 Mycology will require the *21st Century Guidebook to Fungi* (Moore, Robson, & Trinci, 2016), which is available free online. The 3rd edition of Kendrick's (2002) *The Fifth Kingdom: An Introduction to Mycology* also is available in large part free online and is recommended to interested students.

**Syllabus Design:**

As with my other syllabi, I have employed the use of a table of contents to help students readily access information of interest, including an appendix for less essential information related to the course, but information that nevertheless I regard as important to student learning and which allows the syllabus to support relevant teaching and learning from the outset of the course. The syllabus also includes other information supportive of enhancing students' understanding of Northwest Indian College's Teaching and Learning Philosophy and the purpose of course syllabi, as discussed during development of the current Syllabus Guidelines approved by the Curriculum Committee on 10/26/17.

The weekly outline/schedule of topics and assignments is intended to provide a temporal orientation to course content in terms of Indigenous knowledge and cultural significance of fungi, the origins and evolution of fungi, the history and development of mycology as a contemporary scientific subject, and future consideration for mycology and the application of mycological knowledge, e.g., to matters of personal or environmental concern. And, the course will provide a survey of the major groups of fungi and fungal analogues and other topics as included in Moore, et al. (2016). In addition to the required course text, instructor's PowerPoints and additional readings also will be used and made available to students.

**Assessment:**

The course will include informal elements of formative assessment as well as several assignments that will contribute toward summative assessment of each student's learning with respect to the course outcomes and other course topics. To this end, the course includes pre-course, mid-term, and final knowledge surveys in which students may demonstrate aspects of their learning. Student research on mycological topics of interest will be supported by production of a formal paper. And, student collaboration will be supported by efforts toward the development of a checklist and exhibit of local funga. A final self-assessment of student learning is included to address other aspects of the students' experiences through reflection regarding their learning, efforts, limiters or barriers to learning, and what grade they believe they have earned at the end of the course.

**Incomplete Agreement and Grade Change Policies:**

Information regarding incompletes and grade changes is provided, including reference to the instructor's Incomplete Agreement Request Form, which is required for all incomplete agreement requests.

**Course Overview:**

This section includes extended comments regarding fungi and other course goals, how fungi are related to Indigenous human rights, Lummi beliefs that provide guidance for various aspects of teaching and learning, and seasonal considerations regarding fungi.

**Other Elements:**

The syllabus also includes course policies, institutional and program outcomes as related to the course, rubrics for the summative assessment (evaluation) of student assignments, and references for additional materials cited in the syllabus.

**Part 2**

**Comments and Suggestions from the Science Department:**

Review by the Science Department resulted in the following comments and suggestions (E. Norman, personal communication, February26, 2018):

1. A great and well-thought out course.
2. As a 400-level course, there should be a prerequisite, perhaps include ENGL 102 English Composition II and ENVS 201 Northwest Plants or other (unspecified) courses which include topics of evolution, genetics, and taxonomy as prerequisites
3. Compare with other institutions and prerequisites listed.
4. Place information, particularly the syllabus, on Canvas.
5. Students are able to access information readily and remotely.
6. As the syllabus is so lengthy, much of the material should also be included on a Canvas page as well, for easier navigation.

**Response to Science Department Comments and Suggestions:**

1) Thank you.

2) No prerequisites were included in the 2/18/18 syllabus and Science Department feedback included the suggestion of adding a lower-level science course as a prerequisite, e.g., ENVS 201 or one of the 200-level BIOL series, perhaps BIOL 202 Cell Biology (J. Rombold, personal communication, February 22, 2018). Prerequisites of ENGL 102 English Composition II and ENVS 201 Northwest Plants have been added to the 2/26/18 syllabus as with the approved course BIOL 450 Phenology and the proposed course ENVS 350 Winter Plants, as they are expected to help prepare students in terms of writing assignments, biological nomenclature and classification, botanical identification methods and tools, and other aspects currently not treated in other science courses. ENVS 201 is not required for BSNES students, so it is possible that students interested in the mycology course would not have already taken ENVS 201. And, if some other course were included as a prerequisite, that course should have a logical connection to the mycology course in terms of course outcomes, content, student knowledge and skills, etc. Because Science FIG discussion is currently focused on revision of the BIOL 2XX series and other aspects of the BSNES program, including the possible revision of ENVS 201 Northwest Plants, it seems somewhat premature to include any 200-level prerequisite now. However, once work has progressed on BSNES program revision, additional clarity regarding course revisions and the relationship of courses, course outcomes, and course sequences to the overall curriculum may be realized, which may in turn suggest review of this and other courses for possible updating.

Minor edits to the course description also have been made and the course outcomes also have been revised to address concepts that are more overarching in nature than the previous ones.

3) Syllabi from the three mycology courses at WWU, WSU, and UW include the following details, presented here for comparison with the BIOL 450 Mycology course creation materials:

**WWU, BIOL 497 Mycology**

* 1. Prerequisite(s): BIOL 206 or equivalent
		1. BIOL 206 Introduction to Organismal Biology
			1. BIOL 206 Learning Objectives:
				1. demonstrate your knowledge and application of fundamental biological principles in organismal biology utilizing lecture material, lab activities, and other course resources
				2. engage in the methods used to develop knowledge and understanding in biology, with the ability to frame questions and answer problems using the language and methods of biology
				3. develop effective quantitative reasoning skills,
				4. communicate precisely and analytically in written and oral forms
				5. develop enhanced critical thinking skills
				6. engage independently and collaboratively in the scientific process, and
				7. integrate and relate biological concepts to other aspects of your life, including your academic and professional career goals
	2. BIOL 497 Course Objectives—After completing this course, students should:
		1. be able to explain and apply their understanding of the principles of evolutionary biology and the phylogenetic relationships of fungi;
		2. be able to explain and apply their understanding of fungal physiology and ecology;
		3. be familiar with the terminology, tools, and techniques for identifying fungi;
		4. be familiar with the distinguishing macro- and micro-characteristics of fungi in the Pacific Northwest;
		5. be able to collect, identify, and process fungi for an archival herbarium collection.

**WSU, P\_PL 521 General Mycology**

1. Prerequisite(s): None
2. Course Objective: To provide a basic understanding of the biology, taxonomy and phylogeny of fungi.
3. Course Outcomes:
	* + 1. Demonstrate scientific literacy in major concepts and processes relative to the major groups of fungi and fungal-like organisms.
			2. Locate and evaluate sources of scientific information on fungi and fungal-like organisms.
			3. Communicate and work effectively in groups in developing presentations.

**UW, BIOL 440 General Mycology**

1. Prerequisite(s): None
2. Course Goals and Expectations: An overarching theme of the course is to learn as much as possible about the biology and diversity of fungi, their various life histories and their roles in natural and human influenced habitats and environments. The course is evolution based and uses examples of different fungi to document adaptations to terrestrial and aquatic environments with emphasis on the production and dispersal of spores. The lab exercises closely parallel the lecture materials by looking at model organisms that represent examples of major lineages of fungi. Lab exercises emphasize proficient use of the compound microscope and are structured to enhance observational skills and accurate illustrations of the somatic and reproductive characteristics of fungi. The biology and cultivation of fungi is an underlying theme. If you are interested in learning about the diversity, evolution and ecology of fungi this course will provide some basics for you to build on.

4) It is my current practice to provide printed copies of syllabi to students on the first day of class and to use Canvas and upload course syllabi to the appropriate Canvas course sites.

5) Inclusion of a table of contents serves as a useful aid to navigation of my syllabi—both in printed and electronic versions—and the contents may be readily navigated when viewing an electronic (Microsoft Word) version by clicking on page numbers in the content to automatically view the associated syllabus elements.

6) Students routinely provide positive feedback regarding my syllabi. Also, please see #4 and #5 above.

**Part 3**

**Revisions for the Second Reading:**

Based on feedback provided by the Curriculum Committee on 3/22/18 and further review of the proposed course creation materials, the following revisions were made for the second reading:

1) Removal of the final course outcome, which focused on the development of an exhibit of local native plants. After considering the other course outcomes, they seem sufficient and several of them also be met by students working on a final collaborative course product, which may take different forms, based upon student interest.

2) Minor errors in the course creation materials were corrected.

In addition, the following further revisions were made for the second reading:

3) Non-essential information was moved to the syllabus appendix, including the course disclaimer, philosophy statement, purpose statement, and recommended readings. Some of this information was re-ordered.

4) Ampersands were replaced with *and* except in APA Style references and citations.

5) Some text and point and percentage values associated with course requirements and assignments were revised.

6) The rubrics were collapsed into a single rubric for evaluating the formal paper and class project.

7) All fieldwork and lab tools and materials are now designated as required, rather than some being designated as recommended, based on student requests. This language allows many students to obtain funding from their Tribes to purchase required course materials, where recommended materials may not be similarly supported.

8) Syllabus references and citations were updated.