This syllabus and schedule are subject to change. Any changes will be announced in class and posted on the course Blackboard.

**Instructor:** Courtney Scerbak  
University of Alaska Fairbanks  
Murie Building, Room 113  
crscherbak@alaska.edu  
Office Hours: TBD

**Course Information:**  
Location: Murie Building, Room 103  
Class Meetings: Mondays through Thursdays, 12:00 – 1:50 pm

**Prerequisites:**  
CHEM 103X Basic General Chemistry OR  
CHEM 105X, General Chemistry I OR  
Permission of instructor (e.g. passed high school chemistry or advanced biology undergraduate)

**Course Description:**  
This course explores the chemical structure and function of medicinally active compounds from culturally relevant plants and fungi. This course will provide an understanding of plant primary and secondary compounds, an overview of human use of these compounds, and an introduction to the methods used to isolate, deliver, and study plant-derived compounds. A session-long project and class discussion will focus on the medicinal flora of Alaska from a chemical perspective.

EBOT 230 is part of the University of Alaska Ethnobotany certificate program (http://www.uaf.edu/drumbeats/ethnobotany/) and is considered a Biology elective course.

**Textbooks:**  


**Additional Readings:**  
Available free online at:  
http://aknhp.uaa.alaska.edu/traditional_use/Med_Flora_AK_Natives.pdf

Other readings will be available on the course Blackboard (see syllabus for reading assignment due dates)

**Materials:**  
Access to a computer with Internet capabilities will provide the most benefit to students. If you do not own a computer, they are available for student use in various campus computer labs including libraries and the Writing Center.
Course Goals:
- To apply basic chemistry to the action of plant-derived medicinal compounds in humans and in nature
- To discuss the chemical and biological implications of ethnobotanical practices in various cultures, especially Alaskan cultures
- To familiarize students with the resources available to interpret current scientific research, specifically ethnobotanical chemistry and food chemistry
- To provide students with the opportunity to apply topics learned in class activities and discussions to an in-depth project focused on an Alaskan plant

Student Learning Outcomes:
Upon successful completion of this course, the student will be able to:
- Interpret chemical structures and identify functional groups, especially plant secondary metabolites
- Compare the major groups of medicinally active plant secondary compounds
- Make connections between a given plant’s molecular chemistry, ecology, culture, and medicinal value
- Better understand historical uses of plants by indigenous peoples and present day uses of plant drugs
- Discuss the complexities of conducting research in ethnobotanical chemistry and food chemistry (both ethical and technical)
- Curate and interpret scientific findings about medicinal actions of foods
- Describe Alaskan-specific examples of ethnobotanical chemistry

Instructional Methods:
I aim to create a learning environment where students are comfortable and able to actively participate in their learning. Thus, class meetings will typically be composed of short lectures interspersed with relevant individual and group activities. Selected in-class assignments and quizzes will be assigned and graded throughout the session (See Evaluation and Grading). Students are expected to complete assigned readings before class in order to actively participate in discussions and activities (See Tentative Schedule). A session-long project on the medicinal action of an Alaskan plant or fungus covering all topics discussed in class will be assigned the first week of class (See rubric on last page of this document).

Email inquiries from students will be acknowledged promptly – usually within a few hours if sent before 6pm and most always within 24 hours.

Evaluation & Grading:
Grades will be posted regularly on the course Blackboard.

Grading Scale (based upon the percentage of total possible points):
- A 90% or higher; B 80 – 89%; C 70-79%; D 60-69%; F less than 60%

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<thead>
<tr>
<th>Element</th>
<th>Number</th>
<th>Points Each</th>
<th>Total Points</th>
<th>Percent of Grade</th>
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<tbody>
<tr>
<td>Active Class Participation (In-class activities, group work)</td>
<td></td>
<td></td>
<td>100</td>
<td>25%</td>
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<tr>
<td>Formative Assessments (Quizzes, selected in-class assignments &amp; homework)</td>
<td>10</td>
<td>10</td>
<td>100</td>
<td>25%</td>
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<tr>
<td>Botanical Chemistry Project (rubric attached)</td>
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<td></td>
<td>100</td>
<td>25%</td>
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<tr>
<td>Exams</td>
<td>2</td>
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<td><strong>Total</strong></td>
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<td><strong>400</strong></td>
<td><strong>100%</strong></td>
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Course Policies: Course Communications: Course announcements will be made via Blackboard and sent out to student emails via Blackboard. Thus, students are expected to regularly check their university email (or link their university email with an email they do check regularly). I will also make every effort to announce important course announcements during class time.

Technology in the Classroom: I encourage the responsible use of technology (e.g. smart phones, tablets, laptops) during class meetings. However, if your use of any technology becomes disruptive to the class in any way (e.g. cell phone ring tone), you will receive one warning and subsequent disruptions will result in being asked to turn off the device or leave the classroom (and/or bringing in sweet treats for the entire class the next class meeting to ask for forgiveness).

Late Work Policy: Because this is a condensed, six-week course, submitting work on time is critical to being successful in the course. Formative assessments turned in one class period late will receive an automatic 10% deduction, two periods late a 25% deduction and more than two periods late a 50% deduction. Penalties for late submissions for the session long project are described in the project rubric.

Exam Policies: During each exam, you will be allowed to reference one double sided, hand written 8.5” x 11” notes sheet. Chemical structures will likely be most useful on these notes sheets (e.g. functional groups, representative secondary compounds). Make-up exams will only be provided for students who (1) provide proof of a legitimate, unplanned absence (e.g. family emergency, sickness with doctor’s note) OR (2) make arrangements with me well in advance of a planned, legitimate absence (e.g. work-related travel).

Plagiarism Policy: Plagiarism is defined as the use of other intellectual property without proper reference to the original author. Intellectual property includes all electronic, spoken or print media, thus any and all information taken off the Internet is included. Students are expected to correctly cite all sources used in assignments and the project. Cases of plagiarism will be taken seriously with a grade 0 for the particular assignment. Severe cases may be referred to the Department Chair or Dean and/or class failing considered.

Student Support Services: There are many resources available to UAF students to help you be successful in this course and any other courses you may take. Resources particularly relevant to this course include: Rasmussen Library (computers, hard copy books, including required course materials); Mather Library (GI building); Writing Center (801 Gruening, tutors, computers, free printing)

Academic Search Premier will be a useful reference source for the course project:
  a. Browse current scientific literature at no cost to you (at least, for those journals UAF subscribes to, which is a lot)
  b. Log in with UA credentials through UAF Library website (http://library.uaf.edu)

Disabilities Services: I will work with the Office of Disabilities Services (208 WHIT, 474-5655) to provide accommodations for students with disabilities. If you believe you are eligible, please visit http://www.uaf.edu/chc/disability.html on the web or contact a student affairs staff person at your nearest local campus. You can also contact Disability Services on the Fairbanks Campus at (907) 474-7043, fydso@uaf.edu
Every Thursday, part of the class meeting will be used to conduct peer reviews of that week’s assigned Session-long Project Section (see Rubric for details on assignments). Come prepared with an electronic or a hard copy for your peer(s) to provide feedback.

<table>
<thead>
<tr>
<th>Week</th>
<th>Topics</th>
<th>Reading Assignments (To be completed by the Monday of that week)</th>
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| Week 1 (July 6-9) | ▪ Introduction, purpose, and objectives of this course.  
▪ Historical perspective on medicinal botany  
▪ Medicinal plants in nature:  
  o Herbivory  
  o Allelopathy  
  o Pollination | ▪ *The Natural History of Medicinal Plants*, Chapters 1, 3 and 5  
▪ Optional: *Medicinal Flora of the Alaska Natives* (for project plant ideas; link earlier in syllabus) |
| Week 2 (July 13-16) | ▪ Review of chemical structures  
▪ Review of bonding and molecular properties  
▪ Important chemical families in plants:  
  o Primary metabolism | ▪ *Understanding Medicinal Plants*, Chapters 2 and 3  
▪ *The Natural History of Medicinal Plants*, Chapter 4 |
| Week 3 (July 20-23) | ▪ Important chemical families in plants:  
  o Primary metabolism (continued)  
  o Secondary metabolites. alkaloids, cyanogenic glycosides, terpenes, saponins, tannins  
▪ **EXAM I (through plant primary metabolism)** | ▪ *Understanding Medicinal Plants*, Chapter 4 |
| Week 4 (July 27-30) | ▪ Antioxidants  
▪ Medicinal molecule isolation and analysis  
▪ Significant discoveries of medicinal plant chemistry | ▪ *Understanding Medicinal Plants*, Chapter 5  
▪ *The Natural History of Medicinal Plants*, Chapter 6 |
| Week 5 (Aug 3-6) | ▪ Begin drug delivery and action:  
  o Caffeine Case Study  
  o Targets  
  o Action at molecular level  
▪ **EXAM II (through drug delivery and action)** | ▪ *Understanding Medicinal Plants*, Chapters 6 and 7 |
| Week 6 (Aug 10-13) | ▪ Continue drug delivery and action  
▪ Bioprospecting for new medicines  
▪ Protecting medicinal biodiversity and knowledge  
▪ **Project Presentation** | ▪ *The Natural History of Medicinal Plants*, Chapters 8 and 9 |