

## IB435 2024 COURSE INFORMATION AND SYLLABUS

**Course Title:** IB435 Critical Evaluation of Herbal Remedies

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She/her/hers

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They/them/their

**Class hours/week:** MWF 1:00 pm-1:50 pm, 2083 Natural History Building

1 lecture (50 min), 1 discussion (50 min), 1 in-class workshop (50 min) (3 credit hours).

**Textbook:** none

**Readings:** Relevant papers from the primary peer-reviewed scientific literature and from the “gray literature” (reports, patents, dissertations, conference papers, private sector research and other such publications that have not undergone stringent peer-review) where appropriate

**Office Hours:** By appointment

### **Course Description:**

One-third of Americans use health care products derived from natural sources, particularly plants, animals, and fungi. This course examines the biological activity of natural products with respect to their ecological functions and their therapeutic uses. Principles of evidence-based medicine will be reviewed and students will evaluate herbal remedies through lectures, in-class activities, discussions, and analyses of scientific papers. Ideally, students develop skills useful for evaluating alternative remedies and for communicating their conclusions to the general public.

**Prerequisites:** IB202 or IB203 or consent of instructor.

**Grading** (letter grades are based on the curve of total points out of 1000, with no plus/minus grades).

Exams: Three hour exams (drop lowest score of 3 for credit=**30%**)

Systematic review paper—*review/meta-analysis of the scientific literature relating to natural products in one therapeutic chemical class or one natural product with multiple uses* =**15%**

Sci-comm project—*popular article/blogpost/wiki evaluating the therapeutic value of products derived from nature* =**15%**

Participation = **40%**

*Lecture participation will involve answering short questions within a week of the lecture through the Moodle site*

*Discussion sessions will focus on assigned readings from the literature, although the format will vary, and comprise questions submitted by students before class*

*Workshop participation occurs in real-time during class but if missed can be carried out asynchronously with permission.*

*For grading philosophy, see Course Information-Syllabus posted on Moodle*

### **Learning outcomes:**

--by the end of the semester, students should be able to read the label of an herbal product and know how to find information about the purported function of all ingredients, evaluate evidence for its efficacy, and explain to a non-scientist why you do or do not think it's worth buying.

### **COURSE POLICIES**

#### **General:**

This course will follow all policies in the *Student Code*. <https://studentcode.illinois.edu/> As stated in the Student Code, “It is the responsibility of each student to refrain from infractions of academic integrity, from conduct that may lead to suspicion of such infractions, and from conduct that aids others in such infractions”.

If you need disability accommodations, please just contact me and/or the TA at your earliest opportunity so that I can make sure to provide you with the assistance you need. According to campus, “Disability Accommodations -To obtain disability-related academic adjustments and/or auxiliary aids, students with disabilities must contact the course instructor and the Disability Resources and Educational Services (DRES) as soon as possible. To contact DRES you may visit 1207 S. Oak St., Champaign, call 333-4603 (V/TTY), or e-mail a message to [disability@illinois.edu](mailto:disability@illinois.edu).”

**Attendance:** Because 40% of the grade in this class is based on participation, attendance is highly desirable for all class sessions; please alert a TA if you know you won't be able to attend workshops or discussions in real time. If you anticipate problems completing assignments on time, accommodations can be made by contacting the instructor

**COVID and infectious disease information:** Although the federal government has declared the national COVID emergency to be over, this highly infectious disease is still a community challenge. If you test positive and/or just experiencing symptoms, [follow the current guidance from the CDC](#). University policy requires students to engage in appropriate behavior to protect the health and safety of the community, including staying home when ill. These are considered excused absences for the class period and the excused student should contact the instructor via email about making up the work.

### **Class Format**

**The first section** of the semester introduces the diversity of biologically active compounds in plants, animals, and microbes and their ecological functions in the lives of the organisms that produce them. **The second section** acquaints students with the history of medicines from nature and with the evidence-based standards that govern contemporary medical practices. These lectures provide students with the foundation needed for evaluating natural products in conventional, alternative, and complementary medicine in two projects (systematic review and sci-comm). In the **third section**, lectures focus on drug targets, organ- or system-level physiological effects, and efficacy. **The fourth and section**) considers bioprospecting, the utility of ecologically based approaches to guide bioprospecting, and the potential environmental and cultural consequences of “mining biodiversity” for profit.

**Lectures are every Monday and are accompanied by a set of questions for students to answer and then upload to Moodle (submitted no later than Friday of the week of the lecture.** Lecture Powerpoints are uploaded to the Moodle site after class and recorded lectures from previous years (which may not correspond to the current year's lecture) are available as study guides.

**Discussions: Wednesdays are 50-minute discussions involving the scientific literature in some way.** Students will read one or two papers that relate to the Monday lecture/discussion topic of that week and submit one question for discussion by 9 am the following Wednesday. In other weeks, discussions are structured as debates between pro and con teams; other discussions feature UIUC faculty authors of the discussion papers.

**Workshops:** Friday workshops vary and include presentations, demonstrations, experiments, and mastery of skills. Students need an electronic device with Internet connectivity each week to participate in the planned; PLEASE LET ME KNOW IF THIS IS A PROBLEM AND I CAN HELP YOU WITH ACCESS. These workshops are configured to provide experiences that develop skills that will be post-graduation in making evidence-based decisions that relate to health claims and in explaining those decisions to individuals who do not have a biology background.

⊕ **IB43520v2 Critical Evaluation of Herbal Remedies**

Jan	18	Lecture#0	Introduction		
	20	WORKSHOP#0		<i>Strong inference and hypothesis testing</i>	
	23	Lecture#1	Plant chemical ecology		
	25	Discussion#1	Phytochemicals	Case study: foxglove and cardenolides	
	27	WORKSHOP#1		<i>Meet the scientific literature (Kelli Trei)</i>	
Feb	30	Lecture#2	Fungal ecology		
	1	Discussion#2	Mycochemicals		
	3	WORKSHOP#2		<i>Chocolate and clinical trials (J Erdman)</i>	
	6	Lecture#3	Zoochemicals		
	8	Discussion#3	Venoms	Venom comparison across taxa	
	10	WORKSHOP#3		<i>Statistical analysis, meta-analysis (JT)</i>	
	13	Lecture#4	History of medicines from nature		
	15	Discussion#4	CAM, TCM, review		
	17	Lecture#5	Antimicrobials		
	20		First hour exam		
Mar	22	Discussion#5	MRSA	Case study: manuka honey	
	25	WORKSHOP#5		<i>Experiment: human genetic variation</i>	
	27	Lecture #6	Anti-parasitic products		
	1	Discussion#6	Insect repellents	Case study: Skin So Soft®	
	3	WORKSHOP#6		<i>Writing and submitting a science paper</i>	
	6	Lecture#7	Antibacterial agents		
	8	Discussion#7	Cholesterol control	Case study: red yeast rice and statins	
March 11-19	10	WORKSHOP#7		<i>Experiment: Samosas and fennel seeds</i>	
			Spring break		
	20	Lecture#8	Blood, cardiovascular, and respiratory systems		
	22	Discussion#8	Allergies	Case study: Allergies and local honey	
	24	WORKSHOP#8		<i>Reading herbal product labels</i>	
	27	Lecture#9	Skin		
	29	Discussion#9	Cosmeceuticals	Case study	
	31	WORKSHOP#9		<i>Project #1 presentations</i>	
	Apr	3	Lecture#10	Nervous system and sensory organs	
		5	Discussion#10	Anxiety	Case study: CBD
7			Second hour exam		
10		Lecture#11	Urogenital and reproductive organs		
12		Discussion#11	Drug discovery	D. Mitchell	
14		WORKSHOP#11		<i>Communicating with the public</i>	
17		Lecture#12	Interactions between complementary and conventional medicines		
19		Discussion#12	Aromatherapy exercise		
May	21	WORKSHOP#12		<i>CAM and MDs Chance Riggins</i>	
	24	Lecture#13	Ecologically guided bioprospecting		
	26	Discussion#13		Ethics and economics of bioprospecting	
	28	WORKSHOP#13		<i>Project #2 presentations</i>	
	1		Review		
	3		Third exam		

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