Biology 3351 Plants and People

(Fall 2013, Mondays 8:30AM, CB3010A)

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username and password are the same: bio2230

Course Objectives:

Students will be introduced to the basic and essential relationship between plants (as food and resource) and humans (as dependent consumers), in the context of local food security. A few tropical crops will be introduced to add global perspective to the course. Ethnobotany principles and methods will be introduced. Brief writing exercises will improve students' written communication skills.

The main objective of the course is to develop student skill in critically evaluating the scientific basis on which the discipline of botany is grounded.

Most people never learn to think scientifically. Most peoples' ideas about the physical world, and specifically the relationships between organisms have been constructed unscientifically - they have unconsciously picked up what people around them think. They unconsciously internalize information from the media, peers and family. So you, as university students are products of forces you did not choose, and reflect these forces without understanding them. It has been demonstrated on several levels (anthropological, sociological, linguistic and psychological), that humans prefer to believe and internalize "stories", perhaps due to our evolution with oral transmission of information. Rational and critical evaluation of ideas and concepts is a relatively new phenomenon related to written transmission of information, greatly accelerated by the explosion of the computer-driven "information era".

To become a scientific thinker, you have to reverse the process of learning from "stories", by learning to practice skills that enable you to begin to take charge of the ideas you have about the physical world - in this case in the context of botany. It is to begin to think consciously, deliberately and skillfully about that world and the information presented to you. It is to develop a mind that is analogous to the body of a well-trained and skilled athlete.

The course assumes that you have basic understanding of plant structure, and that you understand the basic tenets of scientific inquiry:

Observation; design of experiments; exact measurement; formulation/testing/refinement of hypotheses and theories, which may result in basic laws; elaboration to general laws.

The general plan of the course

The class will focus on linking practice of botany with theory presented in lectures, textbooks and primary scientific papers. It will emphasize your figuring out things about the plant world and its relationship to people using your own mind, not memorizing what is in the textbooks. For every class, you will be expected to read various materials, interpret these in critical ways, and present your ideas to the instructor and class in a written and spoken format. You will be expected to perform "disciplined scientific thinking" and will be evaluating yourself, and be evaluated by your peers and the instructor.

Course prerequisite assumptions:

- Students must have basic understanding of plant structure from introductory Botany (see Chapter 2 in Cotton)
- Students ought to have good writing skills (from English courses or seek help from the Writing Assistance Center) and the ability to perform effective primary literature searches (Biology 2230 and 2910) – seek library help if not familiar with this!

Introduction – Value of plants – images, Food, Inc. DVD

Theory (One third of lectures, based on TEXTBOOK - Ethnobotany, Principles and Applications by C.M Cotton, Wiley, 1996, read Chapters 3 and 4):
Post-harvest physiology, crop preservation - storage and processing (introduction to written assignments)
Plant domestication
Conservation
Ethnobotanical methods
Agriculture - organic vs. standard, good agricultural practice, economics
Collecting plants - documentation, chain of custody, IP ownership issues, Convention on Biodiversity

Practical and CSL component (Community Service Learning - one third of lectures)
Plant use by aboriginal groups (TBA)
Agriculture in Thunder Bay district (Mr. Rudy Buitenhuis)
Import and storage of food from distant sources (supermarkets)
TB Food Security Network (C. Nelson)

Plant species (One third of lectures - wild ancestors, history of domestication, spread to N Ontario, crop characteristics, cultivation methods and yield, future improvement, diseases and pests, products from plants, local cultivation where relevant and/or politics of production for tropical crops):

Solanum tuberosum potato
Malus sylvestris domestica **apple DVD** (L.M.)
Zea mays corn (L.M.)
Heliantus annuus sunflower and oil seeds (L.M.)
Cannabis sativa industrial hemp and medicinal marijuana **DVD** (L.M.)
medicinal plants **and herbalism DVD** (L.M.)
Theobroma cacao cocoa (L.M.)

Class structure (3 hours Monday mornings):
Lectures interspersed with discussion of materials prepared for each class (1-2 hours)
Videos (1-2 hours)

Requirements and grading:

Seven short written assignments, each due before the next class (best 6 will be counted)	6 x 10%
Discussions and brief oral presentation on contents of materials prepared for each class and editorial work on other students' assignments, critical thinking development	10%
Multiple choice final exam	30%
TOTAL	100%

Short assignments:
1. Precis of Chapter 3 in Cotton (due September 23, no references needed)

2. Precis of Chapter 4 in Cotton (due September 30, no references needed)

3. Observation of a plant developmental process (due October 7) (written in the form of journal paper "Results" section). This has to be in paragraph format, **not** point form (day-by-day) description. No

references are needed, since it is based on YOUR observations. If graphical information is used, it has to be accompanied by descriptive figure legends.

4. Critical evaluation of selected paper dealing with plant food processing (due October 21, supported by primary references)

5. Critical evaluation of paper dealing with the use of herbal medicines in the developing world (due October 28, supported by primary references)

6. Critical evaluation of paper dealing with access to food (due November 25, supported by primary references)

7. Critical evaluation of a paper dealing with genetically modified plants (due December 2, supported by primary references)

Through the term, written materials will be exchanged with other class participants, your grading of others and quality of your editorial comments will be evaluated by the instructor, as well as the quality of contributions to class discussions.

Final multiple choice examination (as scheduled by Registrar)