School of Agriculture
Trades & Environment

BK 122 INTRODUCTORY BOTANY 1.5(2-0-1) 8 WEEKS; 24 HOURS

COURSE OUTLINE – JANUARY 2012

INSTRUCTOR: TBA **PHONE:** TBA
OFFICE: TBA **E-MAIL:** TBA

OFFICE HOURS: TBA

REQUIRED TEXT/RESOURCE MATERIALS:

Raven, Biology of Plants 7th ed.
Delaplane, Crop Pollination by Bees
CAPA, Managing bees for crop pollination

RECOMMENDED READINGS:

CALENDAR DESCRIPTION:

This course is an introduction to the structures and functions of flowering plants, physiology of nectar and pollen, and crops that can be used in honey production.

CREDIT/CONTACT HOURS:

This course consists of 2 lecture hours and 1 lab hour per week for 8 weeks; total 24 hours.

DELIVERY MODE S:

Course work includes lectures, discussions, assigned readings, lab exercises, a quiz, and a final exam.

OBJECTIVES:

Course focus is basic botany and background knowledge relevant to beekeepers, honey production and pollination. Specific objectives:

1. To understand the basic structure and function of the flowering plant.
2. To understand the basic morphology and physiology of nectar and pollen.
3. To understand crop production and the crops that can be used in honey production.

PROPOSED **EVALUATIONS:**

Laboratory Exercises (2 @ 10 % each)	20 %
Quiz	20 %
Final Exam	60 %

PROPOSED CONTENT OUTLINE:

1. Introduction
    - What is botany?
    - Why we study botany
2. Understanding basic plant and planetary evolution
    - Understanding evolution of flowering plants
    - Specifically the process of coevolution in plant – pollinator systems
    - Application to systematics
3. Plan Cells and Tissue Systems
    - Plant lifecycle
    - Plant cell structures and function.
        - Major tissue systems
4. Plant Organs (Basic Structure and Function)
    - The root (water and mineral absorption).
    - The stem (translocation).
    - The leaf (photosynthesis).
    - The flower:
        - Internal and external features
        - Development and specialization
        - The nectary and nectar production
        - Development of the male gametophyte (pollen production)
        - Development of female gametophyte
        - Pollination and fertilization
5. Nectar and Pollen Production
    - Utilization.
    - Composition. ->link to bee nutrition
    - Sources.
6. Commercial crop pollination
    - Plant breeding systems
        - Fruit production (e.g. apples vs oranges)
        - Seed production (e.g. clover, alfalfa for seed vs hay, canola)
7. Main Canadian crops
    - Pollination needs
    - Pollination system
    - Where grown and pollinated
    - Hive requirements, strength, number/acre, duration of pollination window etc.

8. Genetic engineering
    - GMO vs GE
    - Common uses for GE in ag products
    - Risks to bees
    - Risks to beekeepers (European GMO ban)
9. Introduce Environmental Issues
    - Decline in margin habitats
    - Loss of wildflower and ag crop diversity – implications for bee nutrition?
    - Decline of native pollinators – where's our safety net?
10. Plant Identification
    - Parts of a plant used for ID
    - Systematics
    - Identification of important Albertan/Canadian nectar sources

Rough Outline

WK 1 - 2 Intro Botany/Plant and Planetary Evolution
WK 2 – 5 Biology Lectures
WK 6 – 7 Application lectures (Pollination)
WK 8 Introduce Genetic Engineering, Environmental issues

Class will run 2 x 1-h lectures +1 1-h lab weekly.