Sample Tier 1 Proposals

Listed below are some particularly good examples of Tier 1 course proposals. Each example is subdivided into component sections. If you want to view a specific proposal section, click on the section title below. To scroll through the proposal from start to finish, click on its title. For a review of the course guidelines for that study area, click on the area heading.

Individuals and Societies, Tier One (Link no longer valid)
Traditions and Cultures, Tier One
- Confucian Asia
  - Course title and instructor
  - Course description
    - Course goals
    - Instructor contact
    - Grading
    - Class participation
    - Writing
    - Academic honesty
    - Tentative schedule of topics and readings
- Goals for Writing Component
- Writing Handbook #2

Physical Sciences, Tier One (Link no longer valid)
Biological Sciences, Tier One
- Plants and Our World
  - Course title, number, and instructors
  - Course description
  - Syllabus
    - Course objectives
    - Exam policy
    - Writing assignments
    - Attendance policies
    - Special needs
    - Academic integrity
    - Incomplete policy
    - Office hours
    - Schedule of topics
  - Appendix A
    Course topics and the concept areas to which they apply
  - Appendix B
    Concepts and skills developed by course exercises
Proposal for a Tier One Traditions and Cultures Course

Proposal for a Tier I course entitled "Confucian Asia" to be taught by Elizabeth G. Harrison, East Asian Studies

Course description and goals

Although the countries of East Asia (China, Korea, Japan) and many of those in Southeast Asia (Vietnam, Singapore . . .) have very distinct cultures, languages, and national identities today, they share one important thing: all have been heavily influenced throughout their history by the worldview known as Confucianism. For this reason, some acquaintance with Confucianism is essential to understanding these Asian cultures both historically and in the contemporary world.

This course is designed to examine Confucianism in Asia through discussion of four areas in which its influence remains clearly evident today: social and political organization, gender relations, education, and the importance of ritual and propriety. Beginning at the beginning, with the life of Confucius in the 6th century BCE and the principle text that bears his name, the *Confucian Analects*, we will explore the central ideas of Confucianism and their adoption and adaptation by different Asian societies at different times. We will end with a consideration of issues in contemporary Asia and among the Asian-American population in the U.S. that both demonstrate and challenge the continued importance of this way of thought.

The instructor's goals for the course are threefold:

- to examine with students the Confucian underpinnings of contemporary Asian societies,
- to help students consider seriously our position as observers of other cultures, and
- to assist students in developing their reading and writing skills.

Weekly discussion sessions will allow students to work together with course instructors to develop their own understandings of course material.

Instructor contact

All instructors for the course (faculty and GATs) will be available to students by e-mail and during regularly scheduled office hours. Two class meetings per week will be in large-lecture format, while the third will be in small discussion groups of 20-25 students each. At least one discussion group will be designated an Honors section and will be taught by a regular faculty member.

Grading

The final grade for the course will be determined from the student's oral and written work in the following way. A student must have a passing grade in each segment of the course listed below in order to receive a passing final grade.
• Class participation (in discussion groups) 30%
• In-class writing 25%
• Short formal papers (3) 25%
• Mid-term and final exams 20%

Class participation

Regular attendance in class and active participation in discussion sessions are required of each student. STUDENTS MUST ATTEND THE DISCUSSION SECTION FOR WHICH THEY ARE REGISTERED. Those who do not attend the first 2 discussion sessions will be dropped from the class. Students are expected to come to class having read and considered the assigned material so that they can follow and ask questions at lectures and participate meaningfully in discussions. The week's reading materials should be brought to each discussion session. The instructor will keep a record of attendance and after each discussion class will give a mark for participation (+ valuable contribution, A adequate contribution, -- minimal or no contribution). At the end of the term, these marks will be totaled and graded on a curve. Daily marks will reflect the quality of participation as well as the quantity.

Writing

• In-class writing assignments: Students will be given a short writing assignment and time to complete it during every class meeting. These exercises are not designed to be quizzes. Rather, they will ask students to use writing to explore various aspects of lectures, readings and discussions. They will be read for quality of thought only and will be given a mark of + (demonstrates substantial thought), A (adequate), or -- (inadequate or off the subject). Because the size of the class precludes making comments on individual papers, a "Writing Handbook" discussing student responses to the previous week's in-class writing assignments will be handed out each week to help students improve their writing. Missed assignments cannot be made up and will be given a mark of 0. At the end of the semester the lowest several marks will be dropped, and the remaining marks will be totaled and averaged for the final grade.

• Short papers: Three 2-3 page papers on assigned topics will be due at regular intervals during the term to give students practice in developing and sustaining an argument or line of thought. Papers will be marked and graded (+ superior, A adequate, R must be rewritten) by the grader for the course, then reviewed by the student's own discussion instructor before being handed back. Appropriateness (whether the essay does what the assignment asks), structure and development of ideas, content, and mechanics will all be considered in evaluating these short papers. A paper must receive a A or better to receive credit. Those which receive an R must be rewritten and turned in within one week of the day the paper was handed back. The original paper must be handed in together with the rewrite. The grade for the rewrite will be the grade the student receives for the assignment. No paper may be rewritten more than once. Late
papers will not be accepted except in exceptional circumstances and with a signed excuse from a doctor or university official.

- **Mid-term and final exam:** The mid-term and final exams will consist of both objective questions and text-based essay questions. The essay questions will be handed out several days before each exam to serve as study guides, but students will not know which text or portion thereof they will be asked to write about until they come to the exam. As these will be in-class exams, they will be graded mainly for content, with written expression a secondary consideration. Make-up exams will only be given for students with written medical excuses or, in the case of the final exam, for students with conflicting exam schedules.

**Academic honesty**

Although I encourage students to get together to talk about the readings and ideas brought up in class, in all cases students are expected to do their own written work. Words or ideas that come from someplace or someone else must be cited: "A good rule of thumb is this: Whenever you consciously borrow any important element from someone else--any sentence, any colorful phrase or original term, any plan or idea--say so, either in a footnote, bibliography, or parenthesis" (from "Academic Honesty in the Writing of Essays and Other Papers", Carleton College, 1990). See the University of Arizona Code of Academic Integrity for specific information regarding UA policy.

**Tentative schedule of topics and readings**

[Note about readings: Since I do not propose to teach this course until Fall 1997, I have not yet chosen all of the specific reading materials. I plan to use a mixture of primary texts in translation (philosophical and literary), academic studies, and contemporary media pieces in order to expose students to a variety of forms of written sources. The quantity of reading will be held, as much as possible, to a reasonable amount, somewhere between 30 and 50 pages per week, so that students can be expected to spend time on it.]

**Part I: Introduction to Confucianism** (2 weeks)

texts: Analects, Mencius, Hsun Tzu

topics:

- Confucius’s life, China in his time (6th century BCE)
- basic principles of Confucianism:
  - hierarchical mode of social order
  - gender relations
  - education
  - ritual/propriety

**Part II: Confucianism as a mode of social order** (3 weeks)
texts: 17 article constitution; Nihon Ryoiki stories; Haboush, A Heritage of Kings

topics:

- early China: Confucianism as Han imperial orthodoxy
- early Japan: Nara government
- early Korea: Confucian kingship

Part III: Gender Relations (3 weeks)

texts: a piece of literature + something else (Sung China); "Great Learning for Women" + something else (Tokugawa Japan); something on Vietnam or other

topics:

- Sung China: Sung legal system, especially regarding women, divorce, inheritance
- Tokugawa Japan: emerging rules for women as wives
- someplace else: Vietnam? (it needs to be here somewhere!)

Part IV: Education (2 weeks)

texts: Peter Bol, This Culture of Ours; Hoyt Tillman's work; Dore, Education in Japan + something else

topics:

- China: T'ang and Sung literati values and academies; Ming examination system
- Tokugawa Japan: NeoConfucian emphasis on study, rise of private academies, temple schools, literacy rate

Part VI: Confucianism in Modern Asia (3 weeks)

texts: mainly recent media articles; Janelli & Janelli, Ancestor Worship and Korean Society

topics:

- China
- Japan: education system, women's roles, a living Confucian teacher
- Singapore: social order, recent caning of American youth, women's roles
- Korea: ancestor worship
- Asian-Americans in the U.S.
My goals for the writing component of this course

I have designed the writing component of this course for incoming freshmen, to acquaint them with and help them toward proficiency in several different types of college writing: timed written examinations, formal papers, and the use of writing to explore their thoughts and ideas. I give them lots of small assignments rather than a few large ones because I feel that what is most important at this level is to have students writing all the time.

The in-class writings are not quizzes; they will not have a "right answer." Rather, they are an opportunity for students to think through and explore ideas that they have encountered in the readings or have just heard in the lectures. They will be treated as rough drafts and graded for quality of thought. I use this type of in-class writing assignment now in my 150-person Gen Ed course, Japanese Humanities, and find that it helps students learn to take a clear stance and support it with evidence from class materials. It also, and perhaps more importantly, helps students learn to marshal their thoughts quickly and put them down on paper in a relatively orderly way in a short period of time (5-6 minutes). I avoid giving letter grades on these papers in order to encourage students to think of the writing rather than the grade.

The size of the class makes written comments directly on in-class writings impossible. To remedy this, I publish a "Writing Handbook" weekly (see attached sample from spring 1996). In this publication I present various student responses to each writing assignment and help students understand what distinguishes an adequate paper from a superior one and from one that does not fulfill the assignment. While this type of writing assignment and feedback does not produce great pieces of writing, it does seem to help students feel more comfortable expressing themselves in writing, and that, I think, is one of the goals of writing in the first year.

The in-class writings also help prepare students for timed exam situations in which they have to produce coherent and well-supported arguments in response to specific questions in a limited period of time. I will give both an in-class mid-term exam (50 minutes) and a final exam (2 hours) in order to show the students this link between the writing they do everyday in my class and the timed exams that they will probably take every semester of their college careers.

Formal, typed papers are the other form of writing that students will have to do throughout their time at the university. During this course, students will do three 2-3 page papers on assigned topics in order to help them consider how to sustain an argument and provide various kinds of support for it. Each paper receives written feedback, and I also produce a "Writing Handbook" covering each formal paper assignment. In order to emphasize writing as a process, I make these papers rewritable, and the grade on the rewrite becomes the final grade for the paper. While it is still difficult to make students take revision of their papers seriously, I find that this gives them real incentive to do so.
Writing Handbook #2
2/2/96
JPN 144

Note: Please correct the due-dates for the three Short Papers that appear in the syllabus as follows: Short Paper #1 is due on Wednesday, February 14; Short Paper #2 on Friday, March 8; and Short Paper #3 on Wednesday, April 10.

1/22: Where in the movie do you see evidence for special concern for any of the 5 elements of a Japanese religious world-view that we have talked about in class (nature, power beyond the human, family, place, ritual)? Describe one instance and how the film made it seem important.

First, let's look at a ✓ response:

A ritual that I noticed in the movie was having the deceased's head towards the north. It seemed important to the old brother. When they brought the father into the living room (or what was being used as the holy area), the old brother made sure that the father was placed in the right direction in the room.

This response answers both parts of the question adequately. The author chose the element of ritual, identifying an instance of ritual (the need to have the head point to the north) and describing how it was made to seem important (the older brother's concern for placing the coffin correctly). Compare this piece to the following + responses:

During the part of the film I did see, the characters were discussing which way was north and how the head of the body must be pointed north. I would guess this is some type of ritual for burial. There was also some talk about practicing lines for the actual funeral. These lines were to be carried out by family members. This shows the importance of family in the ritual of burial. The idea of the body being pointed north also ties into the elements of the natural world. This most likely shows that the place of after-life (heaven) is to the north of this world.

In "The Funeral", attention was brought to the Japanese religious view of place. The scene that most projected this view is when the coffin was first carried into the house. The family had to be sure that the head of the dead body was pointing towards north. This most likely concerns their Buddhist religion. It was turned into a comedic scene where one of the relatives continued inquiring which direction was north and which was west. The comedy in the scene brought more attention to it.

These responses focus on the same scene as the first: the placing of the coffin in the house. Each identifies an element shown in that scene (family, ritual) and describes how the film makes it important (talk about practicing lines; comedy).

But these two responses do something else as well: each shows that the author was thinking beyond the immediate scope of the question. In these two examples, the authors consider what the elements discussed might mean within the Japanese culture (ritual for burial, place of after-
life is north, Buddhist religion). Other responses earned + grades by discussing the ways that the movie's treatment of one element shows how Japanese culture differs from another culture, or how the film used the elements of religion to suggest a conflict between Japan's traditions and its modern culture, or how those elements were sometimes in conflict.

1/24: Think about the place of nature or natural objects in your life. Write about one way in which your relationship with nature is similar to or different from the Japanese relationship with nature we have talked about today.

Before you wrote in class, we talked about how this assignment asks for three different things: an example of nature in your life, an example of nature in Japanese people's lives, and a comparison between the two. Papers that did not contain all three received a -, those which fully and clearly presented all three received +s, and, as before, those that answered fully and clearly and went beyond received +s. In the case of this assignment, papers that received +s showed some kind of self-reflection related to the content of the assignment. Let's see what kinds of self-reflection the authors show in several + papers:

The Japanese relationship with nature seems to be a lot more sacred and meaningful than the way I tend to relate to nature. For instance, the waterfall that the Japanese had marked as a resting place for kami I would see as beautiful, but not necessarily sacred. In comparison to my own life, I see that I usually take nature for granted. I can visit places and enjoy them for their natural beauty, but nature doesn't get much thought on a daily basis. One way I can connect my relationship with nature with the Japanese relationship is that when I lived in California, I'd often use the beach as a place to sit and think and sort out thoughts.

One place of nature for me would be a river, stream or rain. I consider water to be sacred. The reason for this is because of my mother's death; Every time it rains, I feel as if the energy of my mother is there. I feel she is looking down on me and I am able to talk to her. She is there to listen and give me guidance. When comparing this to the Japanese relationships with nature, it is very similar. The Japanese people feel that nature is their deities. In the slides, a tree or waterfall was considered a place of power; a deity could come down at any moment and give of its energy to people. I can understand and agree with very much of this idea. I know I have felt and experienced similar actions.

In Russian culture, part of which I observed in my childhood, during the spring, when the sun starts to shine and melt down the snow, there is a festival. People thank god and ask for a fruitful summer. This is similar to the Japanese relationship with nature, particularly the example of the north side of Japan where people build little "houses" out of snow and ask the kami for rain. In both situations the time of the festival or ritual depends on nature, whether people try to please gods or kami or ask them for a fruitful summer or rain. This shows how close people are to nature and how much they depend on nature's products.

In all three papers the relationship with nature discussed is consciously explored. The author of the first paper observes that her attitude toward nature varies at different times and places; sometimes it appears to resemble a Japanese relationship, but at other times it does not. The second author explores the significance of her strong relationship with water in nature, while the
third author considers cultural reasons for people's close relationship with nature. Compare with the two examples of responses:

The Japanese appear to have a close relationship with and a high regard for the natural world. The relationship seems symbiotic in many ways as the Japanese care for nature and respect it, just as nature takes care of the Japanese. A good example is the way Japanese design their homes and other buildings to coincide, rather than clash with nature. Although I feel I have a close relationship and a great deal of respect for the natural world, I wish I was more like the Japanese when it comes to nature. I would love to wake up every day in a hope that was in sync, rather than conflict, with nature.

In my life one of the things I like to do the most is to hike a mountain. In doing this I feel a sense of conquering the mountain. Also, as I'm climbing I find that I become really focused in the here and now, and it helps to center me. In Japanese culture I noticed the island filled with mountains. There is a place that is an entire kami--Miyajima, that is between 2 mountains. I can very much relate to the reverence the Japanese have found in this powerful structure of nature.

Although both these pieces answer the assignment completely, each would have been stronger if, for example, it had explored how the author came to feel this way. What does it mean for a building to clash with or be in sync with nature? Why does this affect the way we feel? How is it that mountains help center the second author and are so important to a Japanese reverence for nature?

Proposal for a Tier One Biological Sciences Course

**Proposed Course Title:** Plants and Our World

**Proposed Course Number:** NSC 102

**Instructors:**

Robert T. Leonard, Professor, Marley 541D,

Robert G. McDaniel, Professor, Marley 541G,

James W. O'Leary, Professor, Marley 441A,

Dennis T. Ray, Associate Professor, Forbes 415,

Gary A. Thompson, Assistant Professor, Marley 441E,

Judith A. Verbeke, Associate Professor, Marley 441C,
Course Description:

*Plants and Our World* will cover the principles of plant growth, development, and reproduction from the cellular to the whole organism levels, explore how plants are affected by their environment, and their ecology and evolution. The emphasis of the course is on what makes plants uniquely interesting and different from other organisms, and their importance to life and society. The course is designed to help students learn and understand the basic concepts of:

- cells as the basic unit of structure and function in plants and animals;
- the evolution and diversity of the plant kingdom through natural and artificial selection;
- the structure, function and physiology of multicellular plants;
- the development, reproduction and genetics of plants;
- the mechanisms of disease resistance in plants;
- the medical uses of plant products; and
- the structure of populations and ecosystems.

Recurring themes throughout the course are biochemistry, genetics, development, ecosystems, evolution, and similarities between plants and animals.

*Plants and Our World* is based on *Plant Science* (PL S 100), that has been taught each fall and spring semester by the Department of Plant Sciences since 1977, and is presently a successful general education course (on average about 200 students per semester). All of the faculty listed above have taught PLS 100, and have been involved in the development of *Plants and Our World*. Each semester a team of faculty with complementary expertise will teach the course. Graduate Teaching Assistants will be involved in grading of the writing assignments and in helping with the laboratory experiences. We propose to offer *Plants and Our World* starting the Fall Semester, 1997, and then each ensuing semester (spring and fall of each year) with a desired enrollment of between 200 and 250 students. The 3-unit course will be taught in a 2 hours-of-lecture-per-week format in a theater style lecture hall with the usual audio-visual and other multimedia equipment. The third hour each week will be devoted to discussion or laboratory experiences. Laboratory experiences will be a combination of demonstration, presentation and discussion of data, design of experiments and expected outcomes, and small group projects.

The course will provide the students with the basic concepts to understand:

- the language and practice of science in various fields,
- the methods used to pose and test hypotheses,
- the logic involved in developing theories, and
the many important roles plants play in our lives.

Syllabus for the proposed course: "Plants and Our World"

Instructors: Robert T. Leonard, Professor, Marley 541D,

Robert G. McDaniel, Professor, Marley 541G,

James W. O'Leary, Professor, Marley 441A,

Dennis T. Ray, Associate Professor, Forbes 415,

Gary A. Thompson, Assistant Professor, Marley 441E,

Judith A. Verbeke, Associate Professor, Marley 441C,

Teaching Assistants:


Course Objectives: The primary objective of this course is to help you develop a deeper understanding of plants so that you can better appreciate their importance in the lives of all living things, especially yours. Plants are not only an important part of our environment (farms, landscapes and natural areas), they are absolutely essential for our survival and the survival of all life on the planet. They provide us with a wide variety of foods, certain medicines, fibers for clothing, materials to build our homes, as well as wonderful vistas for our aesthetic pleasure. They are the ultimate source of most of the fuels that we use to cool our homes, cook our foods, light our streets, and run our engines. They are usually in our rooms shortly after birth, and they are present at all the significant occasions throughout our lives. It is important to know about the structure of plants, how they work, how they are used by humans for our benefit, and how they might be modified to meet the needs of a growing human population. By the end of the course you will be better equipped to understand and make judgements about issues involving plants and their roles in our lives. Even though we will use plants as the focus of our discussions, we will address a wider range of scientific questions. We hope that you will see that science is a process carried out by "real people," and not just a collection of facts.

Schedule of Lecture and Exams: The schedule of topics for the semester is given on the attached sheets. For most of the topics, there is an assigned reading in the textbook. In some cases, the amount of material contained within the assigned pages is more than we will discuss and for which you will be responsible. For some topics not covered in the textbook, you will be required to prepare short essays based on either library or Internet research.
Grading: | Points
---|---
Four hour-long exams | 400
Writing assignments/laboratory exercises | 200
Final exam | 100

Total Points | 700

Grade Distribution: | Grade | Points
---|---|---
A | 630 - 700
B | 560 - 629
C | 490 - 559
D | 420 - 489
E | 419

Exam Policy: Each of the four exams will cover only the material presented either in class since the beginning of the semester (Exam 1) or since the previous exam (Exams 2, 3 and 4). The final exam is cumulative, thus you will be responsible for all the topics presented in the course. If you miss one of the regular exams during the semester, that exam will be dropped and your cumulative total on the quizzes (see below) substituted for the missed exam. If you miss more than one exam and you have either a written medical excuse or a University approved absence form, then the grade for the second exam missed will be assigned based on the score on the final exam. There are no "make up" exams and you must take the final exam to receive a grade in the course.

There will be unannounced quizzes during the course that will have a cumulative total of 100 points. You have the option of substituting your cumulative score on the quizzes for any one of the four regular 100-point exams.

Writing Assignments/Laboratory Experiences: The primary goal of the writing assignments in Plants and Our World is to help you learn and understand more about the importance of plants in our daily lives. It is after you understand a subject that you can make that understanding available in writing. For that reason, good writing should communicate and generate ideas. In Plants and Our World we will concentrate on helping
you learn how to write effectively by encouraging you to write both imaginatively and critically.

The writing assignments in *Plants and Our World* are directly linked to what you will experience in the lectures and in the laboratory/discussion sessions. Each of the laboratory exercises will require a written report. Students will also be required to write short essays that expand upon topics not covered in the text or address other topics assigned by the instructors. Essay topics will be distributed two weeks before they are due; these assignments are intended to stimulate your thinking about how topics presented in class are relevant to everyday life. Because revision is a critical component of all scientific writing, students will have a number of opportunities to submit drafts for review by the instructors prior to submission of final essays or laboratory reports. For any writing assignment your grade will drop by 10% each day the assignment is late.

The primary goal of the laboratory experiences in *Plants and Our World* is to provide an opportunity for you to actively experience the nature of the scientific endeavor and to help you develop skills that are difficult to teach in a standard lecture format. During the laboratory experiences you will be asked to formulate and test your own hypotheses by designing and conducting experiments. You will generate and analyze actual data and will then interpret these data, sometimes by using mathematical tools to help make quantitative deductions. In *Plants and Our World* we will concentrate on helping you apply these laboratory experiences to events in the everyday world.

Attendance and Classroom Conduct Policies: Although attendance will only be taken sporadically, regular class attendance is expected and will be helpful toward your success in this course. While in class you are expected to conduct yourself in a manner conducive to learning and one that does not interfere with other student's concentration or attention. Questions and discussion are encouraged, but let's have only one person speaking at a time, and pay attention to what either the lecturer or your fellow students are saying.

Special Needs and Accommodations: Students needing special accommodations or special services should contact the Learning Disabilities Programs/SALT, Old Main Bldg., Room 117 (621-1242) and/or the Center for Disability Related Resources, Second and Cherry Streets (621-5227). The needs for specialized services must be documented and verified by one of these units. We will do everything we can to accommodate you in order to enhance your learning experience, but we must know beforehand.

Academic Integrity: Students are encouraged to share intellectual views and discuss freely the principles and applications of the course materials. However, graded classroom, laboratory and homework exercises must be executed independently, except as noted by the instructor. This course operates in accordance with the University statement on "Scholastic Work-Code of Academic Integrity", which appears on page 29 of The University of Arizona Record 95-97 General Catalog and in the "Schedule of Classes".

Incomplete Policy: Any incomplete grade given must be verified with a written agreement with the student which specifies the work to be done and the timetable of completion.
Office Hours: The instructors and the teaching assistants have regularly scheduled office hours and will be available on other occasions (by appointment). The schedule of office hours will be given in class and will be indicated outside of our offices. In addition, you can make an appointment with us after class, by phone, or by e-mail.

Syllabus: The following syllabus is generalized by lecture number, since this is being presented as part of our Tier 1 proposal. In Appendix A that follows this syllabus, is a table that shows how each topic meets one or more of the six major areas (and various subareas) as presented in the "Proposal Guidelines for Tier One and Tier Two Proposals" as adopted by the University-Wide General Education Committee.

SCHEDULE OF TOPICS

**CLASS NUMBER** | **TOPIC** | **READING**
--- | --- | ---
1 | Introduction to the Course The place and role of plants in ecosystems (populations, communities, ecosystems, environmental factors) | Ch. 1 pp. 13 - 20
2 | The place and role of plants in ecosystems (water, carbon & nitrogen cycles, the food pyramid and food webs) | pp. 21 - 30
3 | SMALL GROUP DISCUSSIONS Distribution of plants on a worldwide basis (forests, grasslands, deserts, tundra, etc.) | Ch. 3

**ESSAY** - Description of a biome with which the student is familiar.

4 | Cells and tissues (basic structure of cells, cell and tissue types, organelles, membranes, cell walls) | pp. 70 - 78 & Ch 6.
5 | Growth (meristems and mitosis)

6 | LABORATORY EXPERIENCE Magnification and cell size.

7 | Roots (basic structure & function, modifications) | Ch. 7
8 | Stems and leaves (basic structure & function, adaptations) | Ch. 8 & 9

9 | LABORATORY EXPERIENCE Grocery store botany (Plant parts of common foods)

10 | EXAM 1

11 | Sexual reproduction (floral structure, functions & pollination) | pp. 167 - 175

12 | INTERNET/LIBRARY EXPERIENCE Investigate the economic importance of pollinators.
13 Reproduction and inheritance (meiosis and alternation of generations) pp. 260 - 265
14 Reproduction and Inheritance (Sex Cell Formation & Fertilization) pp. 265 - 268
15 LABORATORY EXPERIENCE Mitosis and Meiosis
16 Inheritance (Mendel's experiments, monohybrid crosses, backcrosses, test crosses) pp. 269 - 271
17 Inheritance (dihybrid crosses, modification of phenotypic ratios) pp. 271 - 275
18 LABORATORY EXPERIENCE Mendelian Inheritance
19 Molecular basis of inheritance (basic structure of DNA, function & replication) pp. 80 - 84
20 Molecular basis of inheritance (RNA, protein synthesis, genetic code) pp. 84 - 89
21 DISCUSSION/INTERNET/LIBRARY PROJECT Biotechnology
22 EXAM 2
23 Energy conversions (thermodynamics, oxidation, reduction & pigments) pp. 217 - 222
24 LABORATORY EXPERIENCE Some basic chemistry: elements, atoms, molecules, pH, osmosis & diffusion
25 Energy conversions (photosynthetic conversion of light energy to chemical energy, photosynthetic production and distribution of sugars & efficiency of photosynthesis) pp. 222 - 230
26 Energy conversions (aerobic and anaerobic respiration) pp. 230 - 237
27 LABORATORY EXPERIENCE Scientific method (Design, conduct and analyze data from an experiment.)
28 Control of growth and development (environmental factors) pp. 239 - 245
29 Control of growth and development (hormones) pp. 245 - 257
30 LABORATORY EXPERIENCE Tropisms and nastic responses
31 Soil as a sources of water & minerals; Nutrition: a comparison of plants and animals pp. 193 - 201
32 Water movement into and through plants (diffusion, osmosis, transpiration & bulk flow) pp. 202 - 215

33 **DISCUSSION/ESSAY** Land and water use in agriculture.

34 **EXAM 3**

35 Evolution & classification (contributions of Linneaus, Darwin, Lamarck, & Wallace to evolutionary thought, speciation) pp. 279 - 287

36 **LABORATORY EXPERIENCE** Design a taxonomic key.

37 Survey of the range of diversity in the plant kingdom Selected examples from Ch. 17, 18, 19

38 Agricultural uses of plants (origins of agriculture, the process of plant domestication, the earliest & current crop plants) pp. 373 - 379

39 **DISCUSSION/INTERNET/LIBRARY PROJECT** Evolution of agriculture

40 Agricultural uses of plants (the agricultural revolution, the green revolution) pp. 380 - 394

41 **EXAM 4**

42 Human impact on ecosystems (alteration of natural ecosystems, biodiversity, endangered species) pp. 416 - 420

43 Human impact on ecosystems (pollution, greenhouse effect & global warming, the ozone layer, acid rain) pp. 421 - 431

44 Medical uses of plants

45 **FINAL EXAM**

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**Appendix A. Course topics and the concept areas to which they apply.**

<table>
<thead>
<tr>
<th>Concepts as Listed in the Guidelines</th>
<th><strong>Course Topics</strong> (Lecture/Laboratory Experience/Discussion Number)</th>
</tr>
</thead>
</table>

1. **Evolution and diversity of life**

   a. Living systems have evolved by natural selection  Evolution & classification (35)
2. Cells

a. All life is made of cells
   - Cells and tissues (4)
   - Magnification and cell size (6)

b. Properties of living systems can be explained in physical and chemical terms
   - Energy conversions (23, 25, 26)
   - Some basic chemistry (24)

c. Metabolism and photosynthesis provide energy

d. Cooperation and signaling between cells allow multicellularity
   - Cells and tissues (4)
   - Growth (5)
   - Control of growth and development (28, 29)

3. Structure and function at the multicellular level

a. Genes encode and transmit information between generations
   - Sexual reproduction (11, 12)
   - Reproduction and inheritance (13, 14, 15)
   - Inheritance (16, 17, 18, 19, 20, 21)

b. Developmental mechanisms are conserved
   - Growth (5)
   - Roots (7)
   - Stems and leaves (8)
   - Leaves, stems, fruits and nuts (9)

c. Genetics, environment, and behavior contribute to human diseases (Genetics and environment contribute to plant diseases)
   - Control of growth and development (28)
   - Agricultural uses of plants (38, 39, 40)

d. Cooperation and signaling between cells allow multicellularity
   - Cells and tissues (4)
   - Growth (5)
   - Roots (7)
   - Stems and leaves (8)
   - Leaves, stems, fruits and nuts (9)
   - Sexual reproduction (11)
e. The plant and cellular systems also have protection against disease

4. Genetics and development

a. Metabolism and photosynthesis provide energy

b. Cooperation and signaling between cells allow multicellularity

c. Plants and animals have common and distinctive physiology

5. Health and disease

a. Genetics, environment, and behavior contribute to human disease (Genetics and environment contribute to plant disease)

b. The plant and cellular systems also have protection against disease
c. Nutrition and lifestyle contribute to health Nutrition (31)
   Land and water use in agriculture (33)
   Agricultural uses of plants (38, 39, 40)
   Human impact on ecosystems (42, 43)
   Medicinal uses of plants (44)

d. Applications of biotechnology are revolutionizing society Biotechnology (21)
   Agricultural uses of plants (38, 39, 40)

6. Interaction and interdependence between organisms

   a. Ecosystems arise from interactions between organisms The place and role of plants in ecosystems (1, 2)
      Distribution of plants on a worldwide basis (3)

   b. Population growth is limited Land and water use in agriculture (33)
      Agricultural uses of plants (38, 39, 40)
      Human impact on ecosystems (42, 43)

   c. Extinction is a fundamental biological process Evolution (35)

Appendix B. Concepts and skills covered in the laboratory exercises, discussions, and internet/library experiences.

<table>
<thead>
<tr>
<th>Laboratory/discussion/Internet/library</th>
<th>Concepts/skills experiences (lecture number)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Distribution of Plants on a Worldwide Basis (3)</td>
<td>Characteristics of plants in an area. What plants are found in an area?</td>
</tr>
<tr>
<td>Magnification and Cell Size (6)</td>
<td>Why are these types of plants in this area?</td>
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<tr>
<td>Grocery Store Botany (9)</td>
<td>Describe the hydrologic cycles in the area.</td>
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<td>Are there groundwater issues in the area?</td>
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<td></td>
<td>Measurements</td>
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<td>Metric system</td>
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<td></td>
<td>Resolving power</td>
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<td></td>
<td>Calculating dimensions as a function of magnification.</td>
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<td></td>
<td>Relative size of cells and parts of cells.</td>
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<tr>
<td></td>
<td>Identify parts of plants (leaves, stems, seeds, fruits) we consume as food.</td>
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<tr>
<td></td>
<td>Importance of plants in human nutrition.</td>
</tr>
<tr>
<td>Topic</td>
<td>Description</td>
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<tr>
<td>--------------------------------------------------------------</td>
<td>-------------------------------------------------------------------------------</td>
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<tr>
<td>Investigate the Economic Importance of Pollinators (12)</td>
<td>Identify the diversity of pollinators (insects, mammals, birds), why they pollinate certain flower types, and their economic importance to agriculture.</td>
</tr>
<tr>
<td>Mitosis vs. Meiosis (15)</td>
<td>Manipulate chromosomes to show how genes are distributed in both asexual and sexual forms of reproduction.</td>
</tr>
<tr>
<td>Biotechnology (21)</td>
<td>The use of biotechnology in plants and animals.</td>
</tr>
<tr>
<td>Scientific Method (27)</td>
<td>Design an experiment that addresses a basic problem. Develop and test a hypothesis. Collect and analyze data.</td>
</tr>
<tr>
<td>Tropisms and Nastic Responses (30)</td>
<td>Environmental effects upon growth and development. Responses of plants to environmental signals.</td>
</tr>
<tr>
<td>Land and water use in agriculture. (33)</td>
<td>Resources important to agriculture.</td>
</tr>
<tr>
<td>Design a taxonomic key. (36)</td>
<td>Evolution, Classification, and Diversity</td>
</tr>
<tr>
<td>Evolution of agriculture (39)</td>
<td>Plant Improvement Human intervention in plant evolution.</td>
</tr>
</tbody>
</table>