OUTLINE FOR THREE EPOCHS AND PERMACULTURE DESIGN CERTIFICATE ON-LINE COURSE

EPOCH I: THE HUNTER GATHERER

In order to learn the intricacies of the local terrain and the origins of technology, for homesteading purposes and a general understanding of the immediate environment, it is important to become familiar with the spatial and temporal dimensions of the lay of the land. Folk and life ways, settlement configurations, geology, plants, animals and weather patterns will give us the ability to hone in our observation and develop creative hand and eye coordination. The ancients were highly skilled at reading the landscape and knew, intimately, where to locate the materials and tools to meet their basic necessities. The majority of the skills listed here are conducted with materials culled only from the local environment. Some skills and equipment used are modern imitations of ancient tools. They are included for comparative analysis. The student is required to seek information and additional instruction necessary in order to complete specific lessons. Learning to seek out appropriate information is tantamount to becoming a complete designer.

TRANSITION BETWEEN EPOCHS I AND II

(Nomads and Pastoralists)

There are essentially two forms of pastoralism. They are known as ***nomadism*** and ***transhumance***. ***Pastoral nomads*** follow a seasonal migratory pattern that can vary from year to year. The timing and destinations of migrations are determined primarily by the needs of the herd animals for water and fodder. These nomadic societies do not create permanent settlements, but rather they live in tents or other relatively easily constructed dwellings the year round. Pastoral nomads are usually self-sufficient in terms of food and most other necessities. ***How can we relate to this lifestyle? How is this lifestyle reflected in our modern world? Are there many similarities and differences in how we live our daily existence?***

EPOCH II **(Settlement)**

Many of the activities are similar to Epoch I, the hunter-gatherer and pastoralism, with the added detail that the hunter-gatherer (and the pastoralist) is now beginning to settle into village life. Ancient agricultural societies are well documented in Egypt, China, the Fertile Crescent of the Mid-east, and India. Although Native American societies may not have been as technologically skilled as these societies, the basic essentials for settlement into the agricultural life are already apparent. Through settlement the opportunity for more detailed observation of the homestead is available. We begin to learn about the "bioregion" with more intimacy. Who and what came before us? How did they use what they found in this place? Who am I in the whole scheme of things?

TRANSITION BETWEEN EPOCHS II AND III **(Discovery of Place)**

As we shift into this transitional period, the hunter-gatherer, pastoralist and small village settler has now made a complete transformation into farm culture and the many uses of appropriate technology. The art of Permaculture has become, in recent years, the penultimate system of eco-agriculture and appropriate technology. It includes all organic systems of agriculture, renewable energy resource development and management, and ecological building practices, within its broad scope. The art of Permaculture demands astute observation and rigorous thinking. It is a design science that seeks connections between all elements in the landscape, so that we may create an ecological web of life that mirrors the local ecosystem in which we live. The transition from design to actualization requires follow-through, perseverance, and the ability to translate theory and thought into action. The following outline is based on the precepts and methods of Permaculture as developed by Australian Bill Mollison in his book, **Permaculture: A Designer's Manual**.

A. Tone-Setting and Themes

B. Permaculture Principles

C. Concepts and Themes in Design

D. The Local Ecosystem: Bioregions (rural, suburban, urban)

E. Forms of Ecological Gardening and Farming (the history of eco-agriculture)

II. METHODS OF DESIGN: Design Strategies and Techniques

Learning Objectives: In this unit students will learn how to make initial observations in the landscape and, through a series of activities (i.e. analysis, data overlay, zoning, etc.), learn how to apply observations to a basic design. They will learn to read maps, delineate a basic zone and sector diagram, utilize methodologies such as relative location, efficient energy planning, diversity, etc. when thinking through their initial drawings. They will make their first attempt at putting down a basic design on paper.

Permaculture is about whole systems, not about separate components. Because each element in a landscape or the built environment affects every other element at a site, we believe that a complete, comprehensive assessment is tantamount to develop healthy, productive, energy efficient relationships between elements for the benefit of everyone involved in day to day operations. By paying attention to all the details: topography, climate, water, wind, sun, activity nodes and corridors, buildings, machinery and tools, the waste stream, plants and animals, it enables us to make best use of what is already on the ground, and what we intend to put there. With a dynamic interaction of elements in process, and an assessment of both spatial and temporal attributes, organized around sound ecological principles, we can maximize yields and balance the landscape.

A. Broad Scale Site Design

B. Applying Specific Methods, Laws and Principles to Design

C. Ideas and Applications

D. Draw Basic Design (based on initial observations of your site)

III. OBSERVATION SKILLS

Learning Objectives: In this unit the student will learn to recognize a diversity of patterns in the landscape through astute and focused observation. Charts and drawings will be presented representing patterns and processes found throughout the natural and created world. We will discuss the spiral and tree form, and shapes thereof, as the basis for all design and movement in the landscape. We will attempt to find a unified expression of geometrical and artistic understanding that will help us to perceive and conceive with the eyes and ears of the artist. Exercises in observation, discussion of what we have observed, and how these observations can be placed within a general pattern understanding, will be discussed. We will also look at how we can utilize what we find, through our observations and understanding, in our designs.

A. Pattern Understanding

B. Pattern Applications: how to apply what we have learned through observation and study (field walk)

IV. CLIMATIC FACTORS

Learning Objectives: In this unit students will learn to forecast the weather through the use of their senses, understand cloud forms, the movement of weather fronts, the affect that different weather systems have on crops, heating and cooling in homes, microclimates, the differences in latitude and altitude on weather patterns, the uses and abuses of modern technology in weather forecasting, and how weather patterns fit into and affect the entire web of life on earth.

EPOCH III: AGRICULTURE, LARGE-SCALE SETTLEMENT, APPROPRIATE TECHNOLOGY AND THE ART OF PERMACULTURE

I. PLANTS AND TREES AND THEIR ENERGY TRANSACTIONS

Learning Objectives: In this unit students will learn to identify trees and plants and come to an understanding of their significance in the landscape. They will begin to delineate the uses of plants and trees for food, medicine and utility. They will observe trees in their natural environment, and through observation, find methods to employ them as windbreaks, shelterbelts, habitat for animals, and companions for other plants that contribute to health and increased yields. Guilds, basic biology, basic botany, affects of weather on vegetation, interactions with animals, and the processes of various habitats and ecosystems will be discussed.

II. WATER

Learning Objectives: In this unit students will learn how to read slope and how water moves by gravity. You will discuss what the hydrological cycle is and its importance in the great web of life. You will learn how to capture water with dams and swales, how to recharge groundwater systems, how to move earth in order to construct earthworks such as ponds, lakes and dams, how to identify the keyline in a landscape, how to assess and construct wetlands for water purification, what kind of vegetation helps to purify water, what to plant in and near swales, ponds, and lakes, how to utilize gray water in orchards and fields, and when the use of septic, leach fields and wells are appropriate. Most of all you will learn that all water used in the landscape and for personal use can be purified and recycled for further use. Water rights and usage are becoming a major issue in the world today: what are these current issues?

A. Regional intervention in the water cycle

B. Earthworks for water conservation and storage

C. Sewage systems and composting techniques (toilets, compost piles, etc.)

D. Purification of polluted waters

E. Grey water

F. Natural swimming pools

G. Wells

H. Septic and leach fields

I. Wetlands for water purification

III. THE SOILS AROUND US

Learning Objectives: In this unit students will experience the intricacies of soil, first hand, through lectures, hands-on tests, sensory exploration, work in the garden, and observation of plants and their growing habits in the landscape. You will use the soil at your site for study. From each segment of the outline you will document what you see in the soil at your site.

A. Function of soils in the ecosystem

B. Practical Application: Soils (hands-on)

IV. EARTHWORKING AND EARTH RESOURCES

Learning Objectives: In this unit you will learn how to survey the land prior to earth moving by measuring slope and area, operate a front loader and back hoe (if available on site), what it takes to shape dams, ponds, swales, terraces, foundations for houses, and other earth constructs. You will explore the differences of a diversity of soils and what it takes to shape them.

A. Planning Earthworks

B. Planting After Earthworks

C. Slope Measure

D. Levels and Levelling

E. Types of Earthworks

F. Earth Constructs (does your current home contain some of these?)

G. Moving the Earth

H. Earth Resources

V. ZONES

Learning Objectives: In this unit students will consider each zone, from zero to five. Zones are an essential methodology of the art of Permaculture. It is how we, as designers, place all the elements, house, energy systems, gardens, animals, etc. on our land-base. The first zone (0) is where our home sits, the place we frequent most. Zone one is where we place our kitchen gardens and the areas that we visit most after Zone 0. As we proceed through Zone 5 we tend to visit each following zone less than the previous one in our daily rounds. It is important that we identify habitat and bioregion type, by climate, topography, soils, etc., before we proceed to map out zones.

A.Zone 0: The Homesite

B. Zone 1: Gardening and Small Farming Practice

C. Zone 2: The Food Forest and Small Animal Husbandry

D. Zone 3: Cropping and Large Animal Husbandry

E. Zone 4: Harvest Forests

F. Zone 5: Natural Forests

VI. AQUACULTURE

Learning objectives: In this unit students will explore aquaculture as a viable and healthy food producing option to only land-based crop production. Aquaculture out-produces agriculture. They will learn that aquaculture is not limited to fish, crayfish, muscles, etc., but that pond and river edges offer more yield near the aquatic environment. Ducks and geese integrate with the food web of the aquatic habitat. The economic potential of an aquaculture farming practice will be discussed. All study and implementation is based on location of the site and local weather patterns.

VII. PLANNING THE HOMESTEAD

Learning objectives: In this unit you will learn about ecological buildings practices, the many uses of renewable energy resources and homesteading chores. Depending on the site, you will practice hands-on building techniques and the instillation of energy systems along with study and discussion. Daily maintenance skills, craftwork, machine and appliance repair, etc. are included. The many skills required to create and maintain the land-base, or eco-village, precludes the need to have familiarity with a diverse set of proficiencies. We will also discuss and map out the most efficient use of time and management to handle daily work and to solve problems. This section especially applies to Zone 0.

A. Structures

B. Craftwork and Chores

C. Equipment, tools, vehicles

D. Renewable Energy

E. Energy Conservation

F. Waste Management and Recycling, Gray-Water, Recycled Materials

G. Tools and Machinery (mechanical, woodworking, metalworking)

H. Vehicles (mechanics, trucks, tractors, bulldozers, backhoe, shovels, mixers, etc.)

VIII. PERMACULTURE STRATEGIES FOR DIFFERENT CLIMATES

Learning Objectives: In this unit you will apply all that they have learned in the previous units and develop ideas for the three broad climatic zone designs. We will research and discuss the contrast and similarities between climatic zones, and see how ideas can be shared between them and what would work specific to a particular climate. We will also discuss how the basic guidelines of the Permaculture are a unified model, and can be applied to any predominant climate.

A. The Humid Tropics

B. Dry-land Strategies

C. Humid Cool to Cold Climates: Temperate Climates (temperature extremes, frost dates and planting zones)

IX. URBAN AND SUBURBAN PERMACULTURE

Learning objectives: In this unit you will learn how to apply all previous lessons to the suburban and urban environments, no matter what the scale. All of the principles and methodologies that we have learned to date are applicable here. Questions unique to these environments will be raised, discussed and solutions brainstormed. The central issue here will be to find ways to "green" cities and suburbs. Efforts must be made to develop natural food production systems, local food security, energy alternatives and building techniques that will allow people to breathe healthy air, drink pure water and recycle massive amounts of waste. Human and vehicular traffic flows must be addressed.

X. SMALL FARM AND GARDEN MANAGEMENT/ MARKETING

A. **Project management**
B. **Budgets**
C. **Business plans**
D. **Yield analysis**
E. **Cost-benefit analyses**
F. **Spreadsheets, accounting, business software**

XI. STRATEGIES OF AN ALTERNATIVE GLOBAL NATION

Learning Objectives: For discussion: Formal and Informal Economies: worker-owned enterprises with non-exploitative relationships, decentralized governance, recognizing ideal relationships between elements in the system and maximizing symbiotic relationships, building strong community, basic necessities (birthrights).

XII. PRACTICAL WORK ON DESIGN

Learning Objectives: Throughout the course we will be working in smaller groups on different aspects of our design (For Ex: a waste management team, a renewable energy team, an agricultural team, etc.). There will be a short review of the basic ideas and areas already covered. Some assessment steps: 1) Observation assessment; 2) Slope; 3) Hydrology; 4) Vegetation; 5) Wildlife; 6) Agriculture; 7) Land layout; 8) Roads; 9) Water; 10) Energy; 11) Wastewater; 12) Walking paths; 12) Dams and lakes; 13) Telecommunications; 14) Create a final design: assessment, planning, bubble diagrams and sketching, timelines, budgets and expenses (labor, tools and materials). We will also look at how to draw the design on paper in a suitable format, with the proper drafting tools and/or design software.

The Steps to Ecological Design

A. WHAT IS THE INTENTION OF THE DESIGN?

1. What are the reasons for this particular design?

2. Determine the amount of environmental integration that can be achieved in the design.

3. Evaluate the ecological and settlement history of the site

4. Inventory the designed system's ecosystem and built infrastructure

5. Delineate the designed system's boundary as a human-made or composite ecosystem

6. Design to balance the biotic and abiotic components of the designed system

7. Design to improve and to create new ecological linkages

8. Design to reduce the footprint of the built environment on the ecology of the locality

B. THE DESIGN PROCESS

9. Design to reduce the consequences of the various modes of transportation and the provision of access and vehicular parking for the designed system

10. Design to integrate with the wider planning context and infrastructure of the local bioregion

11. Design for improved internal comfort conditions in the built environment

12. Design to optimize all passive-mode (or bioclimatic design) options in the designed system

13. Design to optimize all mixed-mode options in the designed systems with partial use of renewable resources of energy and as low-energy design in relation to climate of the locality

14. Design to optimize all full-mode options in the designed system in relation to the climate of the locality

15. Design to internally integrate biomass with the designed system's inorganic mass (ex. by means of internal landscaping, improved indoor air quality, etc.)

16. Design for water conservation, recycling, harvesting, etc.

17. Design for wastewater and sewage treatment and recycling systems

18. Design for food production and independence

19. Design the built system's use of materials to minimize waste based on the analogy with the recycling properties of the ecosystem

20. Design for vertical and horizontal integration

21. Design to reduce light and noise pollution of the ecosystem

C.THE ECOLOGICAL FOOTPRINT

22. Designing the built environment as the transient management of materials and energy input flows

23. Designing to conserve the use of non-renewable energy and material resources

24. Design for the management of outputs from the built environment and their integration with the natural environment

25. Design the building over its lifecycle from the source to reintegration

26. Design using environmentally benign materials, furniture, fittings, equipment, and products that can be continually recycled, reused, and reintegrated

27. Design to reduce the use of ecosystem and biospheric services and impacts on the shared global environment (systemic integration)

D. FINAL ASSESSMENT

28. Reassess the overall design of the entire system in its totality for the level of environmental integration over its lifecycle

XIII. VENDORS: FINDING INFORMATION AND SUPPLIES ***(Please refer to libraries, the internet, magazines, newspapers, etc, for further information on Permaculture and related topics)***

A. Seed companies

A. Equipment, tools, materials suppliers

B. Fertilizer suppliers

C. Tree and small fruit nurseries

D. Renewable energy suppliers

E. Building suppliers

F. Book vendors

G. Magazines

H. Internet resources

XIV. FINAL DESIGN PRESENTATIONS, CONCLUSION, DEBRIEF, OBSERVATIONS, LEARNINGS