**COURSE SYNOPSES**

**DAF 001 Principles of Agroecology**

In the face of global change and natural resource depletion, it has become an imperative to understand the links between biodiversity and ecosystem services. However, biodiversity, ecosystem services and human well-being can be characterized as complex interactions. In this module, a variety of ecosystem service frameworks will be introduced and discussed considering how they help us understand our connection with and dependence on nature. Founded on the principles of embracing and understanding complexity, inviting diversity back into the system, and working with nature rather than against it, the course is designed to encourage students to consider the importance of the different types of ecosystem services based on principles of agroecology.

**DAF002 Principles of Organic Farming**

This course endeavours to introduce students to the fundamental principles of organic farming systems and give them a clear understanding of the approved standard operations and practices at both the local and international market. The students will dig deep into guiding operating standards towards organic certification and certification boards at all levels. Organic farming in this course will be dealt with in general and at broad levels, ranging from crop production, livestock production, aquaculture, apiculture, and various other forms of production. Overall, all organic operations and modes of production must demonstrate that they are protecting natural resources, conserving biodiversity, and only using approved substances. The course will also on how organic agriculture can be used as a tool to mitigate and adapt climate change.

**DAF003: Principles of Soil and Plant Science**

The course forms the foundation of concepts regarding the formation, nature, and management of the soil entity. It therefore requires the students to understand how the soil is formed and characterized over time upon subjection to various biological, physical, and chemical factors. The interaction of these factors determines soil properties that affect plant growth. This course also aims at introducing students to the relationship of plants to the environment with emphasis upon the principles of scientific enquiry. Students will be exposed to the biological concepts of organization, function, heredity, evolution, and ecology as they relate to plants through specific application of the sciences of plant botany, genetics, physiology and reproduction to plant improvement, management and production.

**DAF004 Introduction to Communication and Computer Skills**

This course forms the basic foundation of computer use and applications. This aims at introducing students to computers in agriculture. The course shall cover the following among others, types of computers, computer hardware and software, general computer use and computer applications in agriculture. The use of computers shall be interlinked with the communication skills required in any agricultural field.

**DAF005 Agricultural Practice I**

This course is a practical-based course which aims at giving students hands on practical on-farm experience on crop production. Each course shall be done over a period of one semester. Each student shall be allocated specifics crops to manage throughout its production and marketing value chain. Marks for the course shall be obtained from the student’s performance on the allocated plot and quality of products (crops). In addition visits shall be made to at least three other institutions and or communities per each course to improve appreciation of the practical concepts and learn from challenges faced at each level.

**DAF006: Principles of Agricultural Economics**

The course aims at equipping the student with basic agricultural economics terminology and concepts including definitions of marketing and unique characteristics of agricultural marketing approaches to marketing. This course shall also be focusing on the principle of economics and their application in solving the problems of resource allocation in the Agricultural sector inclusive of project planning and management. The course shall equip the student with the ability to interpret and understand the application of demand, supply, production economics and macroeconomics in different agro ecological settings. Moreover, the course shall expose the student to different levels of farm records and their importance in agriculture and also farm business management.

**DAF007 Organic Crop Production**

Organic crop production course deals with basic concepts, common organic based agronomic principles such as composting and much more than crop to crop management approaches. These concepts are meant to develop an understanding of the important principles underlying the crop management and to develop the ability to apply these principles to production situations. The course aims at introducing students to a number of organic crop production which includes, cropping and farming systems, land selection and preparation for cultivated crops, soils and tillage, planting, Zimbabwe agroecological zones, climate change, irrigation and water management, organic crop fertilisation, weed management, integrated pests and disease management and various other sustainable practices in agriculture production. Students will be encouraged to generate knowledge through examination of several natural and plant-based protection agents such as bio-pesticides and fertilisers, and their potential use in different localities based on availability and efficacy.

**DAF008: Organic Livestock Production**

The production of animals in this course is taken as an integral component which should be opted for in an agro-ecological system to compliment other on-farm processes such as soil fertility and crop production. The course will unpack the different livestock management strategies to optimise the benefits and outputs from the animal section as an entity of mutual benefit in the context of a holistic or mixed farming system. Emphasis during the course shall be also on the use and application of the input-output analysis method, and on the appropriate selection of the animal species to be integrated on the farm, depending on various factors (land size, available feed in the existing system, and markets). The course will also cover the general management strategies of animals applicable in both rural and commercial settings using locally available resources such as ethnoveterinary practices and indigenous knowledge systems in livestock care and management. This course aims to provide students with background knowledge and skills in ethnoveterinary practices. Ethnoveterinary medicine and practices versus orthodox/ conventional medicines will debate in this course.

**DAF009 Climate Change Management**

The course aims to introduce the student to global topical issues of climate changes and how it has affected the agriculture development sector. The whole course will help students to attain a broader and more integrated knowledge on key and current issues in the climate change field and become conversant across the spectrum of climate change issues. The course will also dwell on giving a greater understanding of the history and development of Climate Change field across time and in the process develop a foundation from which they students drill much deeper into adaptation and mitigation issues. The course will ultimately prepare the students to be able to identify the effect of climate change at a national and international level and have the ability to implement projects that adapt and/or mitigate climate change.

**DAF010 Agricultural Extension**

This course aims to introduce students to the concepts of extension and participatory extension approaches considering the change these might bring, whose knowledge/s this incorporates, and how then to encourage change process alongside farmer-practitioners in from the perspective of their own agriculture development. All the concepts to be explored are grounded in an understanding of socio-cultural systems and thinking in communal lands, identifying popular theories of motivation, adult learning, rural sociology and political ecology, and how related concepts feed into extension methods. The course will encourage students to conceptualise the linkages between change and ‘development’ as well as the role of the extension services in the processes. The evolution and rationale of the extension approaches in historical perspective will also be covered in the course to enable students to relate these various extension approaches to community livelihood systems considering sustainability issues. Participatory extension approaches will also be dealt with as a learning approach for enhancing both individual and organisation capacities – central to both enhancing the students understanding about how learning.

**DAF011: Appropriate Technologies in Agroecology**

The course shall introduce students to different alternative sources of power and on-farm technologies which can be used in farming at farm level. Types of draft power, selection of animals for draught power, training of draught animals, management of draught animals and animals drawn implements among others would be some of the issues covered on this course. The course shall also introduce students to building and carpentry works which can be done at farm level in the construction of on-farm structures. Under this section students shall be introduced to the following building and carpentry works principles: materials used in carpentry, joinery works, 13 hand tools and machines, technical drawing, concrete and motor, foundations, brickwork and walling, timbers, plastering, floors, roofs, insulation, lighting, ventilation and maintenance. Appropriate technologies for irrigation management and water conservation would be taught to students.

**DAF012 Agricultural Practice II**

This course is practical-based course which aim at giving students hands on practical on-farm experience on animal husbandry. The course shall be done over a period of one semester. Each student shall be allocated specifics animals to manage throughout its production and marketing value chain. Marks for the course shall be obtained from the students’ performance on the allocated plot and quality of products (livestock). In addition, visits shall be made to at least three other institutions and or communities per each course to improve appreciation of the practical concepts and learn from challenges faced at each level.

**DAF013- Introduction to statistics**

This course will provide an opportunity for participants to understand basic principles of statistics. The students will be equipped in calculation of means, standard deviation, standard errors on means and variance. ANOVA, chi-square, t-test, differentiation, and integration concepts shall be also introduced to students.

**DAF014- Sustainable Seed Production,**

Seed sovereignty lies at the heart of agroecology. Seed diversity in agriculture is the basis of cultural knowledge, family food and nutrition, as well as representing success in terms of pest resistance and yield potential, and well as marketable produce. Hence the course will focus on seed rights and regulations, as well as practical dimensions from seed selection and production to assessing value chains. The biology of seed production regarding pollination and seed development processes will be dealt with in depth during the course. The course will also consider seed production as an industry, thus looking at the economics and issues such as seed conditioning and seed treatment at various levels. The courses will also make students understand the fact that indigenous knowledge systems are valuable in seed services since farmers have been innovating long enough in seed production and seed services before the emergence of formal research and development of these ‘improved’ seeds. The debate around seed sovereignty is heated, and students will be encouraged to explore what this means and to critically analyse the impact of the current seed system (production and distribution) and related international regulations.

**DAF015- Organic Beekeeping**

The course endeavours to cover all aspects of beekeeping in order to impart skills and knowledge to students on the management and production of bees and their by-products in an organic approach. The biology of bees and underlying characteristics in bee behaviour will be covered with emphasis on key points for human influence to improve production and colonies performance. Citing of beehives and their construction will be extensively covered since they heavily influence the success of bee farming, and wider pollination functions. Management of bees as living organisms helpful to the society at large will also consider how to combat pests, diseases and other predators with potential to inhibit production. Beekeeping and its numerous related value chains will be covered in the course, including the processing of honey and by-products, and understanding demand, supply, marketing and distribution at local and regional levels. In addition, the course will take a glimpse at the by-laws affecting beekeeping production at all levels.

**DAF016: Sustainable Land Use Planning**

This course aims to introduce students to principles of land use planning and farm design. The principles shall cover the following: sources of land use information, factors affecting land use and farm design, land and soil classification, pit coding, GIS and remote sensing, use of GPS, Zimbabwe agro-ecological zones, types of farms and land carrying capacity. Students shall be given maps for certain farms and asked to come up with their own proposed design and justifications. The course shall be done in two parts which shall include the theory and practicals where students will physical plan for a given farm. The course will explore ways in which communities can build more trust and an increased sense of community to have greater harmony and shared prosperity while taking care of the commons. The students will explore the four pillars of sustainability and the role of integrative design in community building. They will explore the value of cooperation and cooperative enterprises as well as the role of conflict prevention and resolution in peace building.

**DAF017- Plant Propagation and Management**

This course will introduce students to sustainable natural resources management principles in the face of continuously depleting natural resources. In depth understanding of silviculture, Agroforestry and Afforestation practices and their potential in revitalising depleted lands and disjointed ecological processes shall be dealt with in the course. Various plant propagation techniques and strategies used to enhance plant viability and vigour, such as grafting, budding, layering, scarification, etc, will be explored within the value chain of silviculture from seeds to plant products. Plants mainly to be covered in the course are categorised into broad ranges of multipurpose trees, herbs, fruits, and some indigenous plant species that are almost extinct in their native areas. Farmer managed natural plant regeneration (FMNR) techniques we also be pondered on during the course. We also pay particular attention to various challenges encountered in conservation of natural resources and how these can be managed to maximise on natural resources conservation.

**DAF018: Health and Safety Education**

This course aims at introducing students to health issues and their impacts to the agricultural industry paying much particular attention to the Agro ecology. The course shall cover among others the following health issues or topics: male and female reproductive systems, human behaviour, adolescent, adulthood, HIV/AIDS symptoms and prevention, sources of infection, HIV home-based care, opportunistic diseases, and emerging pandemics.

**DAF019 Sustainable Rangeland and Pasture Management**

The course is heavily centred on the management systems of grazing lands and pastures that foster continual support of pastures and natural regeneration. Recognizing the severing of the ecosystem that resulted from the decimation of the great herds, the holistic management approach to pasture and grazing lands management attempts to restore balance by moving livestock in a manner that simulates the pack density and mobility of the wild grazers. This helps recreate the desirable ruminant impact while eliminating deleterious effects of conventional livestock management. It is achieved through the participatory development of grazing plans (with agropastoralist) that stimulate plant growth, provides natural fertilization, and keeps the herds from returning to eat the same plants until they are fully re-grown. The course will pay close attention to the applicability with regards to different ecosystems and (including existing and/or indigenous plant and animal species. This holistic management approach takes as its basis that fully functioning grassland ecosystems cannot be sustained without herds of grazing animals and their proper management is of paramount importance hence entire framework focuses on creating healthier soils through all the decisions and planning processes through in livestock feed management.

**DAF020 Postproduction Management and Value Addition**

This course shall introduce students to guiding principles of post-harvest handling practices of both horticultural and agronomic crops with the aim of minimising crops losses maintain good quality after harvest. In addition to crops, the course shall also cover the management of animal related outputs and their respective handling and management throughout the value chain to the consumer from production stage. Students will discuss the various processes and procedures at postproduction as key components within the value chain and explore how best losses can be minimised at all levels possible. The course shall also cover the value addition initiatives within the crop and animal products value chains to increase beneficiation and profits.

**DAF021- Organic Aquaculture**

This course focuses on the standard recommended organic approach to small-scale cultivation of mainly freshwater fish species based on profound understanding of general aquatic biology and requirements for survival. The course will look at the value chain of different fish species categorised considering species selection, feeding characteristics, general habitat conditions for reproduction and extensive production at different stoking rates. Different levels of aquaculture systems will be discussed and evaluated with regards to applicability within different contexts. The course will also capacitate students on designing fish farms at an integrated approach levels to other existing farming entities and will include practical skills development in site selection & pond construction, breeding and rearing, nutrition and health management, harvesting and post harvesting management skills.

**DAF022 Sustainable Energy Systems**

The course will provide the background on renewable energy with an overview on power generation today, to understand the physics of energy processes and its implications for the future. The course will also share the most important renewable energy technologies and their applicability in different community settings. Students will be invited to evaluate the practicalities and limitations of these renewable technologies and compare it with conventional carbon-based energy systems. The present energy resources and demands of the world will be analysed and renewable energy scenarios that are technologically feasible and economically viable for the future will be investigated.

**DAF023 Watershed and Field Water Management**

The course therefore prepares students to understand the various methodologies that can be used to harvest and manage rainwater and inculcate in them a culture of water conservation. Due to indiscriminate development and rapid urbanisation, exposed surface for soil has been reduced drastically with resultant reduction in percolation of rainwater, thereby depleting ground water resource. This course prepares students to come up with potential solutions to leverage and rectify such a situation. Students will learn and critically discuss several watershed management strategies and rainwater harvesting processes or systems to augment the natural filtration of rainwater into the underground formation. This conscious collection and storage of rainwater to cater to demands of water, for drinking, domestic purpose & irrigation is to be deeply enshrined in environmental management principles and ecological conservation principles. The course will also critically analyse and discuss on a number of irrigation techniques utilised in field water management.

**DAF024 Course Project**

The student shall be entitled to conduct research that seeks to solve real life challenges faced by an identified community. The module seeks to engage the student into the research fraternity and applications of research work to day-to-day life. In a farmer-led approach to research, the student shall be working closely with an allocated supervisor to assess the course of work from the onset to the results of each research initiative.

**DAF030: Industrial Attachment**

This course aims to introduce students to work-related learning experience. Under this course students shall undergo an internship for a period of at least 9 months at an agro-industrial farm/organisation. During attachment period students shall be expected to learn and know attached organisations’ operations, duties in the following organisational units or departments: crop, animal, appropriate technology and economics and be able to apply concepts taught in practical fields.