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**Department of Field Crop and Medicinal Plants**

**College of Agricultural Engineering Sciences Salahaddin University- Erbil**

**Subject: Agro-ecology**

**Course Book (Theoretical Part)**

**Second Year Students**

**Lecturer's name**

**Dr. Aryan Suad Ahmad Dizayee**

**BSc. Plant Production 2008**

**Msc. Medicinal and Aromatic Plants 2013**

**PhD. Crop Ecology 2020**

**Academic Year: 2023-2024**

**Course Book**

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| **1. Course name** | Agro-ecology | |
| **2. Lecturer in charge** | Lecturer: Dr. Aryan Suad Ahmad Dizayee | |
| **3. Department/ College** | Field Crops / Agricultural Engineering Sciences | |
| **4. Contact** | e-mail: aryansuad@yahoo.com  Tel: (optional): 07504958591 | |
| **5. Time (in hours) per week** | Tuesday 8:30am-10:30am | |
| **6. Office hours** | Daily from 8:30 to 2:00 | |
| **7. Course code** |  | |
| **8. Teacher's academic profile** | Date of Birth: 11 June 1987  Place of Birth: Erbil  Nationality: Iraq  Marital status: Single  Sex: Female  **Education:**  **B.Sc:** Plant Production/ / College of Agricultural Engineering Sciences (2007-2008)/ University of Salahaddin/ Kurdistan Region/ Iraq.  **M.Sc:** Field Crops/ Medicinal & Aromatic plant/ College of Agricultural Engineering Sciences (2013)/University of Salahaddin/ Kurdistan Region/ Iraq.  **PhD:** Crop Ecology/ College of Agricultural Engineering Sciences (2020) / University of Salahaddin/ Kurdistan Region/ Iraq.  **Work History:**  College of Agriculture, Field Crops department/ University of Salahaddin /Iraq  June 2020 until date (Lecturer)  As an lecturer, I have teaching:  I was assisting assistant lecturer in teaching Tobacco production for Third year student, from 2013-2014.  I was assisting assistant lecturer in teaching Tobacco technology for Fourth year student, from 2014-2015.  **3.** I was assisting assistant lecture in teaching Medicinal & Aromatic plant for Fourth year student, from 2014-2015, 2015-2016, 2016-2017, 2017-2018.  **4.** I was assisting lecturer in teaching Agro-ecology and Agro-meteorology for Second year student, from 2018-2019, 2019-2020 and 2021-2022. | |
| **9. Keywords** | Ecology, Agro-ecology, Biosphere, Organism, Community, Population, Ecosystem, Energy flow, Climate zone, Region | |
| **10. Course overview:**  Agroecology is the science that provides the basic ecological principles for how to study, design and manage agroecosystems that are both productive and natural resource conserving, and that are also culturally sensitive, socially just and economically viable.  Agroecology aims at the holistic study of agroecosystems which are seen as complex systems in which ecological processes occur, e.g. nutrient cycling, predator/prey interactions, competition, symbiosis and successional changes. Implicit in agroecological research is the idea that, by understanding these ecological relationships and processes, agroecosystems can be manipulated to improve production and to  produce more sustainably, with fewer negative environmental or social impacts and fewer external inputs. | | |
| **11. Course objective:**  A major goal of agroecology is the revitalization of peasant and small family farms and the reshaping of the entire agricultural policy and food system in ways that are economically viable and socially just to farmers and consumers. New approaches and technologies involving application of blended agroecological science and indigenous knowledge systems and spearheaded by thousands of farmers, NGOs, and some government and academic institutions are proving to enhance food security while conserving agrobiodiversity soil and water resources conservation throughout hundreds of rural communities in the developing world. | | |
| **12. Student's obligation**  The objective is for the student to understand: A key agroecological strategy in designing a sustainable agriculture is to reincorporate diversity into the agricultural fields and surrounding landscapes. Diversification at the field level occurs as variety mixtures, rotations, polycultures, agroforestry, crop-livestock integration, etc and at the landscape level in the form of hedgerows, corridors, etc, giving farmers a wide variety of options to assemble spatial and temporal combinations. | | |
| **13. Forms of teaching**  **Teaching Methods**  1. Lecture  2. Self‐study  **Teaching Media**  1. PowerPoint presentations  2. Texts and teaching materials | | |
| **14. Assessment scheme**  Each student will be asked on collecting literature and write a scientific report (term paper). We will start most class periods with a short quiz. The quizzes could cover any information presented before that date, but will usually cover information presented in the most recent lectures. The quizzes will be given during the first 5 to 7 minutes of the class period. Exams will consist of a variety of questions, including definition, multiple choices, true/false, matching, diagram and reasons for, occasionally short answer.  **Note:** Number of exams and lectures for each exam did not specify. | | |
| **15. Student learning outcome:**   * Enhance recycling of biomass and optimizing nutrient availability and balancing nutrient flow. * Securing favorable soil conditions for plant growth, particularly by managing organic matter and enhancing soil biotic activity * Minimizing losses due to flows of solar radiation, air and water by way of microclimate management, water harvesting and soil management through increased soil cover. * Species and genetic diversification of the agroecosystem in time and space at the field and landscape level. * Enhance beneficial biological interactions and synergisms among agrobiodiversity components thus resulting in the promotion of key ecological processes and services. | | |
| **16. Course Reading List and References‌:**   1. Wibbelmann, M., Schmutz, U., Wright, J., Udall, D., Rayns, F., Kneafsey, M., Lennartsson Turner, M. (2013). Mainstreaming Agroecology: Implications for Global Food and Farming Systems. Coventry: Centre for Agroecology and Food Security, Coventry University. 2. Brym, Z.T., Reeve, J.R. (2016). Agroecological Principles from a Bibliographic Analysis of the Term Agroecology. In: Lichtfouse E. (eds) Sustainable Agriculture Reviews, vol 19. Springer, Cham. 3. Colin, A., Pimbert, M., Kiss, C. (2015). Building, defending and strengthening agroecology, a global struggle for food sovereignty. 4. Lin, B., Chappell, M. Jahi & Vandermeer, et al. (2011). Effects of industrial agriculture on climate change and the mitigation potential of small-scale agro-ecological farms. CAB Reviews: Perspectives in Agriculture, Veterinary Science, Nutrition, and Natural Resources. 6. 1-18. 5. FAO website: “10 key elements of Agroecology”. | | |
| **17. The Topics:** | | **Lecturer's name** |
| In this section The lecturer shall write titles of all practical topics he/she is going to give during the term. This also includes a brief description of the objectives of each topic, date and time of the lecture. | | Lecturer's name  Dr. Aryan S. A. Dizayee  ex: (3 hrs) |
| **18. Theoretical Topics (If there is any)** | | : (2 hrs.) |
| **1st week:** Environment and Ecology  **2nd week:** principles of agro ecology  **3rd week:** Agro-ecology and sustainable agriculture  **4th week:** Climate Zones, Vegetation Regions, Biomes and Ecosystems  **First Exam**  **5th week:** Global Warming  **6th week:** Energy flow in ecosystem  **7thweek:** Movement of energy  **8thweek:** Nitrogen Cycle  **9thweek:** Organic Farming  **10thweek:** Farming systems and biodiversity  **Second Exam** | | 4/10/2023  11/10/2023  18/10/2023  25/10/2023  1/11/ 2023  8/11/2023  15/11/2023  22/11/2023  29/11/2023  6/12/2023  13/12/2023 |
| **19. Examinations:**  ***1. Compositional:*** In this type of exam the questions usually starts with Explain how, What are the reasons for…?, Why…?, How….?    **1.Write the definition only (4) of the following terms or statements:**  ***2.Enumerate the following:***  ***a*** ***3. What is the difference between*** | | |
| **20. Extra notes:**  Some of the lectures will be presented in PowerPoint lecture will be provided in class. Some | | |
| **21. Peer reviewپێداچوونه‌وه‌ی هاوه‌ڵ**  This course book has to be reviewed and signed by a peer. The peer approves the contents of your course book by writing few sentences in this section.  *(A peer is person who has enough knowledge about the subject you are teaching, he/she has to be a professor, assistant professor, a lecturer or an expert in the field of your subject).*  ئه‌م کۆرسبووکه‌ ده‌بێت له‌لایه‌ن هاوه‌ڵێکی ئه‌کادیمیه‌وه‌ سه‌یر بکرێت و ناوه‌ڕۆکی بابه‌ته‌کانی کۆرسه‌که‌ په‌سه‌ند بکات و جه‌ند ووشه‌یه‌ک بنووسێت له‌سه‌ر شیاوی ناوه‌ڕۆکی کۆرسه‌که و واژووی له‌سه‌ر بکات.  هاوه‌ڵ ئه‌و که‌سه‌یه‌ که‌ زانیاری هه‌بێت له‌سه‌ر کۆرسه‌که‌ و ده‌بیت پله‌ی زانستی له‌ مامۆستا که‌متر نه‌بێت.‌‌ | | |