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**Department of Field Crops and Medicinal Plants**

**College of Agriculture**

**University of Salahaddin**

**Subject: Agricultural Engineering Practices 2**

**Course Book – (Year 2)**

**Lecturer's name: Assist. Prof. Rabar Fatah Salih, PhD**

**Miss. Delan Rizgar Hadi, MSc.**

**Academic Year: 2022/2023**

**Course Book**

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| **1. Course name** | **Second Semester** | |
| **2. Lecturer in charge** | **Assist. Prof. Dr. Rabar Fatah Salih** | |
| **3. Department/ College** | **Field Crops / Agricultural Engineering Sciences** | |
| **4. Contact** | **e-mail: rabar.salih@su.edu.krd**  **Tel: (optional) +964 782 4670202** | |
| **5. Time (in hours) per week** | **Theory: 1 in Study Lab 3 & some other on online**  **Practical: 3 in Study Lab 3 and in the Field Practices** | |
| **6. Office hours** | **10 Theory, 8 Practical** | |
| **7. Course code** |  | |
| **8. Teacher's academic profile** | [C.V - Rabar Fatah Salih - Google Sites](https://www.google.iq/url?sa=t&rct=j&q=&esrc=s&source=web&cd=1&cad=rja&uact=8&ved=0ahUKEwiNp6i5rJXSAhXhFZoKHZmVB2YQFggYMAA&url=https%3A%2F%2Fsites.google.com%2Fa%2Fsu.edu.krd%2Frabar-fatah-salih%2Freflections&usg=AFQjCNE3HOKThraPamS8vQBroIvuivbqEw) I am a lecturer at Salahaddin University - Erbil, College of Agriculture, Department of Field Crops. I hold a PhD as an assistant professor of Post-Harvest Engineering, Field Crops/ Fiber Crops.  I graduated as the fourth best student in department of plant production, and the tenth best student in the whole of the College. After graduation, I directly employed as a demonstrator at the same Department and College. In 2010, I obtained a MSc at the Department of Field Crops, College of Agriculture, Salahaddin University - Erbil.  I also completed a PhD study in 2016 in Post-Harvest Engineering at the Department of Biological and Agricultural Engineering, Faculty of Engineering, Universiti Putra Malaysia.  I attended to three international conferences as presenter in 2014 and 2015, Malaysia, one of them in Erbil 2017. However, I attended to other three international conferences just as guest all of them in Erbil, 2016-2017. Also, I published many academic papers in international journals. However, I published a scientific book on kenaf plant, 2015.  Two article researches were submitted, it was done in 2017 and 2018. Moreover, I have a new project about “Row Spacing and Seeding Rate Affect on Growth and Yield Parameters of Flax (*Linum usitatissimum* L.)”.  I attended to the 1st International Agri Sciences Conference 2019 Salahaddin University-Erbil, College of Agricultural Engineering Sciences. Also, I am as a member and supervision of the Second Agriculture Exhibition which was done with the conference (7-6 November 2019). | |
| **9. Keywords** | **Agricultural Engineering, Agricultural Development Projects, Seasons and Systems of Farming…** | |
| **10. Course overview:**  Agricultural Engineering Practices is a new course for our students in Department of Field Crops. During this course, want to teach them how to apply new knowledge about agricultural engineering practices from farm. Additionally, which is to improve their concepts about; farm power and machinery engineering, soil and water conservation engineering, irrigation and drainage engineering, post-harvest system engineering, ..... etc. Also, believed that it will be helpful to understand students about what is an Agricultural Engineers and what do they do? | | |
| **11. Course objective:**  The overall objectives of Agricultural Engineering are to provide a conducive working environment for the farmer and assure him that there is dignity in farming, improve his economic situation and make food available in adequate quantity and quality at the right time of need and at a reasonable cost to consumers. Additionally, to understand students about the meaning of an Agricultural Engineer, also teach them what things should do as Agricultural Engineers. | | |
| **12. Student's obligation**   1. Participation is more important; every student should be pay attention during a class. It will be encouraging them to collect information about the subjects. Next, it causes to earn all scores very well. 2. Students should be found the topics which relationship to fiber craps, then make presentation. It will be not only to collect the score but also to teach them how to be a lecturer and researcher in future. 3. There will be a short, timed, quiz once a week, on Wednesday. These quizzes will be open book and open note. Quizzes will emphasize interpreting information, formulating hypotheses, and synthesizing concepts from lecture. I will drop the three lowest quiz scores. Quizzes will cover all course material covered to-date. 4. During this course to exams will be done. The first exam will be after 4 lectures, the second exam after 8 lectures or in the end of the course. | | |
| **13. Forms of teaching**  In the first, I preparing lecture as a hard copy and I give to my students’ whole together. I also during the class used data show and I preparing power points of the lecture then I explain for them. Some time, if subjects need to more explanation, I using white board for them. Actually, for every class I have a short video (Document) about the topics. It is more important and interested for understanding them. | | |
| **14. Assessment scheme**  I have a plan about assessment and examination for the students as following:   * I preparing two types of exam about (Theory part) and also all students must be attending of examination two times. * Students must be attending of examination two times (Practical part). * I have quiz for students every weeks. It is helping them during exam, and also it causes to active them during a class. * I have questions during a class, since I believe that it attracts students and then helps them to easy understanding. * Class participation 5% * Presentation 5% * Weekly quizzes 10% * First Exam 40% * Second Exam 40%   That information also can be fitted to the practical part with its subjects. | | |
| **15. Student learning outcome:**  In the result believe that, students learning more new things about Agricultural Engineering Practices, and also it will be useful for them when graduated at University. | | |
| **16. Course Reading List and References‌:**   * Anandajayasekeram, P., Van Rooyen, CJ., and Liebenberg, F., (2004). Agricultural Project Planning and Analysis: A Sourcebook Second edition. UP University. * Barger, E.L., Carleton, W.M., Mckilben, E.G., and Bainer, Roy., (1952). Tractor and their Power Units. Soil Science, vol. 73, issue 5, p. 418. * Biggs, G., and Tripathi, N., (2003). Agriculture Mechanization Committee of Bangladesh United nation. Asian J. Agric. Eng. Mac., 5(1): 146 –152. * Chandrasekaran, B., Annadurai, K., and Somasundaram, E., (2010). A Text Book of Agronomy. Copyright © 2010, New Age International (P) Ltd., Publishers Published by New Age International (P) Ltd., Publishers. * https://www.thespruce.com/small-farm-4127721. * Imran, A., Omair, F., and Wajiha, A., (2017). Impact of Agricultural Engineering Practices on Farm Management: A Case Study of Gharo Model Farm. PSM Biological Research., 2(1): 40-45. * Jagdishwar Sahay (2014). Elements of Agricultural Engineering. Formerly, Prof. & Head Farm Power & Reniewable Energy Dept., R.A.U, PUSA, Samastipur 5th Edition, 2014 ISBN 81-8014-044-X. * Kepner, R.A., Bainer, Roy., and Bergar, E.L., (1978). Principles of Farm Machinery. Third Edition. * Segun R. Bello (2012). Agricultural Engineering Principles & Practice. Federal College of Agriculture Ishiagu, 480001 Nigeria, Printed by Createspace US. * Ojha, T.P., and Michael, A.M., (2017). Principles of Agricultural Engineering Volume-1 (Farm Power, farm Machinery, Farm Buildings, Post Harvest-Technology). * Water Management (Agro. 201 Lecture Notes), ANGRAU. | | |
| **17. The Topics:** | | **Lecturer's name** |
| **1st lecture**  **Harvesting and Post Harvest Technology**  **Harvesting**  **A. Harvest Index (H.I)**  **B. Time of Harvesting**  **C. Criteria for Harvesting of Crops**  **D. Methods of Harvesting**  **E. Post Harvest Processing**  **2nd lecture**  **Methods to Improve Farming Productivity**  **How to Improve Farming Productivity? 1. Implementation of land reforms**  **2. Interplant3. Plant more densely**  **4. Plant many crops**  **5. Raised beds**  **6. Smart water management**  **7. Heat Tolerant Varieties**  **8. Use nitrogen**  **9. Improved seeds**  **10. Plant protection**  **3rd lecture**  **Agricultural Practices and Tillage Operations**  **Seedbed preparation**  **Definition of tillage**  **Tillage requirements and objective**  **Functions of tillage**  **4th lecture**  **Crop Planting and Establishment**  ***Factors affecting plant establishment***  ***Definition of terms***  ***Seed quality:***  ***Seed purity:***  ***Seed germination:***  ***Seed vigor:***  ***Seed size and plumpness:***  ***Seed health:***  **5th lecture**  **Crop planting methods and patterns**  ***Patterns of planting on flat surface***  ***Methods of planting on ridges or beds and heaps***  ***Comparative-use advantage of planting patterns***  ***Implications of planting patterns on planter performance Inter-row spacing requirements***  ***Intra-row spacing requirements***  **First Examination (Theory)**  **6th lecture**  **Planting equipment**  ***Functions of planting equipment***  ***Factors affecting selection of planting equipment depend on:***  ***Factors affecting planting accuracy:***  **7th lecture**  ***Types of planting equipment:***  ***Hand-held dibbers/dibbler***  ***Hand held planters***  ***Hand push planters***  ***Animal-drawn planters***  ***Seeders (grain drills)*** | | Rabar Fatah Salih    (1 hrs)  (1 hrs)  (1 hrs)  (1 hrs)  (1 hrs)  (1 hrs)  (1 hrs)  (1 hrs) |
| **18. Practical Topics (If there is any)** | |  |
| Some lectures relatively to practical part will be done from Field practices (Grdarasha Research Field), and some other will take in lab.  **1st lecture**   * Introduction to Agricultural Engineering. * Agricultural Engineering & Agriculture engineers. * Agricultural Machinery. * Agricultural Operations.   **2nd lecture**   * Farm System. * Agricultural Development. * Basic Steps of Agricultural Practices.   **3rd lecture**   * Introduction to Agricultural Land Surveying * Surveying * Measurements in survey * Units of measurementin survey | | Miss. Media Nofel Mohammed Fawzi, MSc.   * Date of Birth**:** 31 July 1990 * Place of Birth**:** Baghdad * Nationality**:** Iraqi * Marital status**:** Married * Sex**:** female   **Education:**   * **B.Sc:** Field Crops / College of Agriculture (2011-2012) / University of Salahaddin / Kurdistan Region/ Iraq. * **M.Sc:** Plant Physiology (Physiological Growth Indices and Agronomic Traits of Mungbean as Influenced by irrigation Intervals, DAP Fertilizer and Row Spacing)/ (2017) / The College of Agriculture / University of Salahaddin / Kurdistan Region/ Iraq.   **Work History:**   1. College of Agriculture Engineering Sciences, Field Crops department/ University of Salahaddin /Iraq.   \* I graduated from College of Agriculture Engineering Sciences in 2012 (Ranked First in Field Crops department).  \* I hold a Master's degree in Plant Physiology. I was awarded this degree in 2017.   1. College of Education, Arabic department/ Makhmour.   May 2019 until date ( Assistant Lecturer)  \* I was assisting assistant lecturer in teaching Computer Skills IT for first year student, from (2017-2018).  I was assisting assistant lecturer in teaching Computer Skills IT for first year student, from (2018-2019).    (3 hrs)  (3 hrs)  (3 hrs) |
| abdazzez**19. Examinations:**  **Salahaddin University**  **College of Agricultural Engineering Sciences**  **Department of Field Crops**      **Agricultural Engineering Practices (Theory)**  **Stage: 3**  **Time: 1h.**  **Date: / /2021**  **Q1:**  **Define the following terms: (5 only) (25) Marks**     1. Crop planting 2- Seed quality 3- Stubble 4- Harvest Index (H.I) 5- Interplant 6- Tillage   \*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*  **Q2:**   1. **Count the factors can improve farming productivity. (10) Marks**      1. **Write something about post-harvest processing, and what are its objectives?** **(15) Marks**   \*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*  **Q3:**  **a)** **What are the functions of tillage? (5 only)**  **(10) Marks**    **b) How to read this image or talk about it? (10) Marks**    **c) What are the factors affecting plant establishment? (05) Marks**  \*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*  **Q4:**   1. **Draw a figure to show the broadcasting pattern. (10) Marks** 2. **Write briefly on check row planting. (10) Marks** 3. **What is the seed purity? (05) Marks**   **Lecturer**  **Assist. Prof. Dr. Rabar Fatah Salih** | | |
| **20. Extra notes:** | | |
| **21. Peer review پێداچوونه‌وه‌ی 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.‌‌ | | |