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**University of Salahaddin**

**College of Science of Engineering Agricultural**

**Department of Horticulture**

**Subject: Nut and Miscellaneous Fruits Fruit Trees**

**Stage: Third stage**

**Lecturer's name: Dr. Parween Muhammad & Dr. Jihad Shareef**

**Academic Year: 2023/2024**

**Course Book**

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| **1. Course name** | **Nut and Miscellaneous Fruits**  |
| **2. Lecturer in charge** | **Dr. Parween Muhammad & Dr. Jihad Shareef** |
| **3. Department/ College** | **Horticulture/ Agricultural Engineering Science / Third stage** |
| **4. Contact** | **Tel: (optional)**  |
| **5. Time (in hours) per week**  |  **Theory: 2 hours per week** **Practical: 3 hours per week**  |
| **6. Office hours** | **Availability of the lecturer to the student during the week****Probably from three to four times per week if I have not lecture, or /and if the students asked me always I will be at office as I could.**  |
| **7. Course code** |  |
| **8. Teacher's academic profile**  | PERSONAL DATA**Dr. Parween Muhammad**• Sex: Female• Nationality: Iraqi• Marital Status: Married EDUCATIONScientific Degree: Year / Research Subject / University • B.SC : Year / Research Title / University2005/ plant production / College of Agriculture/ University of Salahaddin/ Iraq.• M.SC : Year/ Research Title / University2010/ Horticulture / College of Agriculture/University of Salahaddin/ Iraq.• PhD : Year/ Research Title / University2020/ Horticulture/ College of Agriculture/University of Salahaddin/ Iraq. MEMBERSHIP OF PROFESSIONAL ASSOCIATION:• Teachers Association• Agricultural Engineers Syndicate• لێره‌ مامۆستای وانه‌بێژ پرۆفایلێک ده‌نووسیت له‌سه‌ر ژیانی ئه‌کادیمی خۆی (ته‌نها ئه‌کادیمی) |
| **9. Keywords**  | **Nut fruit tree, description, propagation methods, fertilization, pruning.** |
| **10. Course overview:**  This course book is designed to familiarize the students with importance of deciduous fruit trees especially the most popular deciduous fruit trees that found or can grow with environment of our country properly, and the relationship with other disciplines. The basic principles of tree growth and development will be addressed that include the environmental conditions which consist of climatic factors and soil factors which have a great role in growth and development and other principle is plant care and what plant need and also choosing the variety or cultivar is other important principle when we talk about fruit tree in general and specially when we talk about deciduous fruit tree because these type of trees have rest period or dormancy stage which the trees need enough chilling hours (chilling requirement) to break this dormancy stage and start the growth when the temperature increase relatively. To know the important propagation methods of deciduous fruit trees as we know there are two main methods first one is sexual (by seed) by using this way the resultant plant will be never true to type, and asexual method (by any part of the plant except the seeds) in this way the new plant (the resultant plant) will be true to mother plant, also it is important to know which way is the best, low cost and easy of each different tree. Subject of culture practices is other important thing when we talk about fruit trees because these culture practices that include (Irrigation, fertilization, weed control, pest control and training and pruning etc.) and the time of practicing each practices is very important because each one have different rate and different time or date to do it in an orchard or in permanent place due to having direct effect on plant growth and on quality and quantity of production.  |
| 11. Course objective:The aim of this subject to know the type of deciduous fruits that aptness to the Kurdistan conditions.* Knowledge the student to know the important of nature and commercial of different fruit types.
* Definition the student to the kinds of stable rootstock, them characterizes and their compatibility with different fruit types.
* Study climatic and environmental requirements of these types of fruit, also to know the nature of their blooms and bearing.

Study the ways of harvest and symbols of harvest to these kinds of fruit |
| **12. Student's obligation**In this section the lecturer shall write the role of students and their obligations throughout the academic year, for example the attendance and completion of all tests, exams, assignments, reports, essays…etc. The student should be attendant for all lectures and comply of all tests or theory that done and shall comply the exams and assignments. The student also shall participate in class activities and present reports on subjects that I choose or they choose by their selves. لێره‌ مامۆستا به‌رپرسیارێتی قوتابی خوێندکار ڕوونده‌کاته‌وه‌ سه‌باره‌ت به‌ کۆرسه‌که‌ بۆ نموونه‌ ئاماده‌بوونی قوتابیان له‌ وانه‌کاندا، له‌ تاقیکردنه‌وه‌کاندا، راپۆرت و ووتار نووسین... هتد.  |
| **13. Forms of teaching**Generally, data show will be used with power point, white board and paper of the lecture is also use. لێره‌ مامۆستا ڕێگه‌ی وانه‌‌ ووتنه‌وه‌ ده‌نووسێت، بۆ نموونه‌:‌ داتاشۆ و پاوه‌رپۆینت، ‌سه‌ر ته‌خته‌ڕه‌ش، ته‌خته‌ی سپی، سمارتبۆرد یان‌ مه‌لزه‌مه‌... هتد |
| **14. Assessment scheme**Breakdown of overall assessment and examinationThere are two monthly examinations and every week there is a quiz at the beginning of the lecture or sometimes at the end of the lecture. At the end of the course the students shall present a report. Classroom participation and assignments (Total: 25%), exam 20% and 5% for quizzes and student participation and attendance. Final exam: 40%لێره‌ مامۆستا جۆری هه‌ڵسه‌نگاندن (تاقیکردنه‌وه‌کان یان ئه‌زموونه‌کان) ده‌نووسێت بۆ نموونه‌ تاقیکردنه‌وه‌ی مانگانه‌، کویزه‌کان، بیرکردنه‌وه‌ی ڕه‌خنه‌گرانه (پریزه‌نته‌یشن)، ڕاپۆرت نووسین، ووتار نووسین‌ یان ئاماده‌نه‌بوونی خوێندکار له‌ پۆلدا...هتد. ئامانه‌ چه‌ند نمره‌ی له‌سه‌رده‌بێت و مامۆستا چۆن نمره‌کان دابه‌شده‌کات؟‌ |
| **15. Student learning outcome:**EXPECTED LEARNING OUTCOMES: Upon completion of Deciduous Fruit Production students will… 1. Identify different families of deciduous fruit tree and most important groups, varieties or cultivars of each family. Describe the importance and uses of different type of fruits. 2. Identify the major differences between deciduous fruit trees according to method of training and pruning method of harvesting and quality and quantity of fertilizer that the tree needed.3. Discuss the need of market to these productions of fruit trees and how to arrive them to the market with high quality at write time and how to store them.پڕکردنه‌وه‌ی ئه‌م خانه‌یه‌ زۆر گرنگه‌، مامۆستا ده‌رئه‌نجامه‌کانی فێربوون ده‌نووسێت. بۆ نموونه‌: ڕوونی ئامانجه‌ سه‌ره‌کیه‌کانی کۆرسه‌که‌ (بابه‌ته‌که‌) بۆ خوێندکار‌گونجاندنی ناوه‌ڕۆکی کۆرسه‌که‌ به‌ پێویستی ده‌ره‌وه‌ و بازاڕی کارقوتابی چی نوێ فێرده‌بێت له‌ ڕێگه‌ی پێدانی ئه‌م کۆرسه‌وه‌؟This should not be less than 100 words  |
| **16. Course Reading List and References‌:**▪ Key references:▪ Useful references:▪ Magazines and review (internet): |
| **17. The Topics:** | **Lecturer's name** |
| **1. Pistachios-Introduction- economic and nutrient importance -- Climatic requirements - Soil preference–Adaptation -– Pollination -Alternate Bearing - harvest and storage.****2. Walnut –Walnut Family )- morphological and biological characterize – climatic and environmental factors – bearing and flowering –Irrigation- Harvest & Store Black Walnuts.****3. Pecan - morphological characterize - nature bud development-Nut size and kernel development–Flowers and pollination- Climatic requirements - Humidity and rainfall - Soil requirements- Alternate bearing - harvest and storage for Pecan****4. Hazelnut – economic and nutrient importance – climatic and environmental factors. Chestnut groups. flowering fertilization - Pollination - Keeping Quality- harvest****5. First mid semester exam****6. Pomegranate – economic and nutrient importance – Origin – Adaptation – Location – Ideal Temperature Range - Light Requirement - Regular and Deep Watering- cracking - Pre harvest treatment - Harvesting, Packing, Storage.****7. Fig - economic and nutrient importance – climatic and environmental –Fig Pollination - Life cycle - Harvesting and Yield- Latex – Toxicity - Medicinal Uses- Manuring and fertilizer - Fig Pollination - Keeping Quality.****8. Kiwi- – economic and nutrient importance – Origin – Adaptation – Climatic requirements - Soil preference–Pollination - Regular and Deep Watering-propagation****9. berry -** [Origin and Distribution](http://www.hort.purdue.edu/newcrop/morton/japanese_persimmon.html#Origin%20and%20Distribution) **-** [Cultivars](http://www.hort.purdue.edu/newcrop/morton/japanese_persimmon.html#Cultivars) **-** [Pollination](http://www.hort.purdue.edu/newcrop/morton/japanese_persimmon.html#Pollination) **-** [Climate](http://www.hort.purdue.edu/newcrop/morton/japanese_persimmon.html#Climate) **-** [Soil](http://www.hort.purdue.edu/newcrop/morton/japanese_persimmon.html#Soil) **-** [Propagation](http://www.hort.purdue.edu/newcrop/morton/japanese_persimmon.html#Propagation) **-** [Culture](http://www.hort.purdue.edu/newcrop/morton/japanese_persimmon.html#Culture) **-**[Cropping and Yield](http://www.hort.purdue.edu/newcrop/morton/japanese_persimmon.html#Cropping%20and%20Yield) **-** [Packing, Keeping Quality and Storage](http://www.hort.purdue.edu/newcrop/morton/japanese_persimmon.html#Packing,%20Keeping%20Quality%20and%20Storage)**.****10. Second mid semester exam****10. Chestnut – economic and nutrient importance – climatic and environmental factors. Chestnut groups. flowering fertilization - Pollination - Keeping Quality- harvest.** **11. Strawberry and Blueberry,** [Origin and Distribution](http://www.hort.purdue.edu/newcrop/morton/japanese_persimmon.html#Origin%20and%20Distribution) - [Cultivars](http://www.hort.purdue.edu/newcrop/morton/japanese_persimmon.html#Cultivars) - [Pollination](http://www.hort.purdue.edu/newcrop/morton/japanese_persimmon.html#Pollination) - [Climate](http://www.hort.purdue.edu/newcrop/morton/japanese_persimmon.html#Climate) - [Soil](http://www.hort.purdue.edu/newcrop/morton/japanese_persimmon.html#Soil) - [Propagation](http://www.hort.purdue.edu/newcrop/morton/japanese_persimmon.html#Propagation) - [Culture](http://www.hort.purdue.edu/newcrop/morton/japanese_persimmon.html#Culture) -[Cropping and Yield](http://www.hort.purdue.edu/newcrop/morton/japanese_persimmon.html#Cropping%20and%20Yield) - [Packing, Keeping Quality and Storage](http://www.hort.purdue.edu/newcrop/morton/japanese_persimmon.html#Packing,%20Keeping%20Quality%20and%20Storage). |  |
| **18. Practical Topics (If there is any)** |  |
| * Planting of different trees to know how to prepare the soil and how to plant the tree the depth and diameter of the hole that the tree planted in and what we must do after planting a tree.
* Cutting: the student should make cutting to familiarize the types of cutting and time for producing cuttings and how to plant or store the cuttings.
* Visiting some local orchards to see different types of trees and how they planted and cared.
* Pruning of the tree: students must practice pruning process to know different systems of pruning.

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  |  |
| **19. Examinations:**1. Explain Climatie in the walnut (Juglansregia) .Q2) explain orchard establishment in the Pistachio. Q3) Take about **environmental factors in the nut.****Q4) What you know about Nut size and kernel development in the nut.****Q1)-Climate**A dry climate is preferable for commercial walnut production. It is possible to grow walnuts in high humidity climates, but the danger of walnut blight and other diseases is much greater.High temperatures during summer are ideal. Temperatures frequently soar into the high 30s and above, and sunburn is a problem the lower end of the acceptable summer temperature range. Our walnut trees don’t grow as fast in cooler temperatures, but the quality of our nuts is high.Walnuts need some winter chilling and temperatures down to –10°C pose no problem in the winter, when the trees have no leaves. However, young shoots, leaves, catkins and flowers may be damaged by frosts of –1 to –3°C during October and November. It is important in areas where late frosts may be a problem to select suitable cultivars.There are two climatic factors. The first is wind. The second is the wildly fluctuating weather during our spring and autumn. It is common for a warm spell in early spring to prompt bud burst, which may be followed over the next few months by a series of strong winds, hail, driving rain, and frosts – any of which can damage the soft new growth and disrupt pollination of flowers. There is not much you can do, except protect small trees from frost as far as possible and provide shelter for walnut trees of all ages. Once the trees are about two meters high, the frost danger is greatly reduced.**Q2) - Orchard establishment**  Weed control is necessary to reduce water competition and disease.    After grafting, 4-6 years are required before the trees begin to bear, but they do not bear fully until the trees are 20-25 years old. Trees may continue to bear for 40 to 60 years or more. The ideal spacing of mature trees is about 8-10 m. Tree growth is very slow and many orchards contain temporary filler trees as crowding is not expected for 12-15 years.   The recommended fertilizer application at planting is 50 gms/plant of 20:10:10 NPK. This rate can be gradually increased yearly to a level of 40 kg/ha in year 10. Zinc and boron deficiency are commonly encountered, and foliar analyses may help to identify this before the symptoms become apparent in the leaves.Q3) - **Rootstocks**  Scion cultivars are budded onto seedling rootstocks. Because bare-rooted trees are difficult to transplant it is necessary to establish orchards with plants grown in containers, or with young rootstocks which are subsequently field-grafted.   P. Vera is susceptible to nematodes so other Pistachio species are used as rootstock.1 - P. atlantica and 2 - P. terebinthus have good resistance to nematodes and soilborne diseases and are used by Australian propagators. However, both species are susceptible to Verticillium wilt, and in Cali- ornia P. intergerrima is now used where his disease is a problem. The rootstocks have varying degrees of cold-tolerance. P. terebinthus is most cold-tolerant, P. antlantica is susceptible to cold below -7ºC and P. intergerrima is even less cold-tolerant. When seedling rootstock trees are 2-3m tall, selected cultivars are bud-grafted to them. **Pollination** As female flowers are receptive for only about 4 days, male trees shedding pollen during the first half of female blooming period should be selected. Usually one male tree is planted to 8 female trees as a 3 x3 block of females with a single male in the centre. Pollination occurs by wind or air drift, although bees may actually take quantities of pollen and thereby reduce fruit-set. **Yields and economics**  Trees usually begin bearing in the 4th- 5th year after budding, but an economic crop is a further 4 years away. In California 8-15 year-old trees yield 2-8 kg of in-shell nuts/tree, giving 200-800 kg/ha. 16- 30 year old trees yield 8-30 kg/tree (800-2400 kg/ha). Adult trees average 11.25 kg annually, with the Californian state average yield being approximately 1 t/ha. However, pistachios are prone to alternate bearing, with a heavy crop one year followed by little or no crop the following year. Three kilos of unshelled nuts are equivalent to one kilo of shelled nuts, with most nuts marketed unshelled and salted. Using data from 1991 and assuming an in-shell price of$400 to the grower, 100 ha of trees are required for an economically viable orchard. At a higher price of $590/kg a 10 ha orchard could be vi- able. At higher yields this area could be even smaller. **Q4) -** **Rootstocks**  Scion cultivars are budded onto seedling rootstocks. Because bare-rooted trees are difficult to transplant it is necessary to establish orchards with plants grown in containers, or with young rootstocks which are subsequently field-grafted.   P. vera is susceptible to nematodes so other Pistacia species are used as rootstock.1 - P. atlantica and 2 - P. terebinthus have good resistance to nematodes and soil borne diseases and are used by Australian propagators. However, both species are susceptible to Verticillium wilt, and in Cali- ornia P. intergerrima is now used where his disease is a problem. The rootstocks have varying degrees of cold-tolerance. P. terebinthus is most cold-tolerant, P. antlantica is susceptible to cold below -7ºC and P. intergerrima is even less cold-tolerant. When seedling rootstock trees are 2-3m tall, selected cultivars are bud-grafted to t |
| **20. Extra notes:**Here the lecturer shall write any note or comment that is not covered in this template and he/she wishes to enrich the course book with his/her valuable remarks. |
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