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**Department of Biology**

**College of Education-Shaqlawa**

**University of Salahaddin-Erbil**

**Subject: Theoretical Plant Taxonomy**

**Course Book – Year 2**

**Lecturer's name: Mr. Hiwa Hussein Hasan**

**Academic Year: 2022/2023**

**First Semester**

**Course Book**

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| **1. Course name** | Theoretical Plant Taxonomy | |
| **2. Lecturer in charge** | Hiwa Hussein Hasan | |
| **3. Department/ College** | Biology/Education-Shaqlawa | |
| **4. Contact** | e-mail: [hiwa.h.hasan@su.edu.krd](mailto:hiwa.h.hasan@su.edu.krd)  Tel: 009647507805992 | |
| **5. Time (in hours) per week** | Theoretical: 2 | |
| **6. Office hours** | hours | |
| **7. Course code** | EdB1203 | |
| **8. Teacher's academic profile** | There is no doubt that the teacher as a main factor of the teaching process, has a very good and important role in performance the teaching program and preparing the students, he is the follower of the results of teaching process and try to progress this process. The teacher is an affected factor among the teaching factors, and has effect on the student’s characters and their future, therefor; the teacher must beware in his treatment with the students and the teaching staff. For all the progress that take place in the world, in all the fields, such as cultural, social, scientific, technology, etc. … , the teacher must suit himself with all these changes and benefit from them in order he can finally to reach these benefits to all peoples that he treat with them. | |
| **9. Keywords** |  | |
| **10. Course overview:**  This course will cover the basic systems, principles and methods utilized in modern plant systematics. This course will examine recent develops within the field of systematics in the areas of phylogenetic systematics and classification. The laboratory portion of the course will be spent introducing the student to the classification and identification of some of the major taxa in the vascular flora of Iraq. | | |
| **11. Course objective:**  Students will:  • Improve skills in critical, synthetic thinking and logical reasoning  • Become proficient in plant identification skills, including the use of technical keys.  • Learn the major plant communities/vegetation regions of our area.  • Gain a basic understanding of botanical vocabulary and terminology.  • Learn to use and understand phylogenetic trees. | | |
| **12. Student's obligation**  The role of students and their obligations throughout the academic year involve their attendance in the lectures, drawing all the plates and plant specimens concerning to the lecture, and completion of all daily (quizzes) and monthly tests, exams, and preparing some herbarial plant specimens, as well as collecting fresh plant specimens within the field trips during spring and summer seasons. | | |
| **13. Forms of teaching**  **1. Blended learning in theoretical lectures**  **Flipped Classroom:**  **The Standard Inverted Classroom**: Students are assigned the “homework” of watching video lectures and reading any materials relevant to the next day’s class. During class time, students practice what they’ve learned through traditional college work, with their teachers freed up for additional one-on-one time.  **The Group-Based Flipped Classroom:** This model adds a new element to help students learn — each other. The class starts the same way others do, with lecture videos and other resources shared before class. The shift happens when students come to class, teaming up to work together on that day’s assignment. This format encourages students to learn from one another and helps students to not only learn the what the right answers are but also how to actually explain to a peer why those answers are right.  **2. Lab based Learning especially in practical part:**  Laboratories are wonderful settings for teaching and learning science. They provide students with opportunities to think about, discuss, and solve real problems. Laboratory teaching assumes that first-hand experience in observation and manipulation of the materials of science is superior to other methods of developing understanding and appreciation. Laboratory training is also frequently used to develop skills necessary for more advanced study or research.  **3. Surveys:**  To determine the presence, relative abundance, status, and distribution of abiotic resources, species, habitat, or ecological communities at a particular point in time | | |
| **14. Assessment scheme**  **The midterm and final exams** will include technical definitions by term and from photos or diagrams, family identifications from written descriptions and photos, and short answer questions about material covered in both lecture and lab. All electronic devices will be surrendered for the duration of each exam.  **Flip Participation** involves your preparation and contributions to the reverse lectures, where you will learn the material on some families on your own, filling out the worksheets linked on our web site. We will then discuss the families and any questions in class. I’ve had mixed evaluations of this process, so if, as a class, we prefer straight lecture, we may discontinue the flipped classroom project.  **The paper** will be 5-7 pages (not including Literature Citation section), double spaced, typed in a readable font (e.g.: Times New Roman 14, Arial 12) on any topic of your choice that is related to this course. You must cite at least 15 modern primary literature papers. Use Web to search for primary literature papers. Use the librarians for help researching your topic. Please use standard scientific citation format (though not numbered). You must also submit your paper to a plagiarism checking site.  **Herbarium Collection / Project:** A herbarium collection of 5-10 specimens will be required of all enrolled students. Generally, students will collect with the instructor on one of a few independent trips to a specific region (to be determined). Additional specimens may be collected as part of a project, e.g., a floristic survey of a general region (such as a small region in Kurdistan mountains), in which all plants in the area are collected, with documentation (to be discussed). Alternatively, extra projects, for the interested/advanced student might involve a taxonomic problem, such as evaluating the validity of a subspecies versus a species or annotating our specimens of a particular group (e.g., a family or genus).  **Seminar:** will be conducted both in class and lab. Our goal here is to help the students prepare for professional talks, the focus is on giving them the feedback that they need to improve. You don't do them any favors by telling them what you think they want to hear.  **Lab quizzes** will be conducted both in the field and in the lab. Each quiz will include 10 specimens to be identified by family, genus and species. SPELLING COUNTS. Quiz dates are listed on the lab schedule. I will drop your lowest quiz score, if it is not a zero from an unexcused absence. If I have credible evidence that you have cheated on a quiz, your score for that quiz will be zero.  **Lab keying** exercises will be conducted as listed on the lab syllabus. Each of you will independently key 3 to 5 fresh specimens to family, genus and species. Be certain to bring your *Manual to the Vascular Flora of the Iraq* to each keying exercise.  **The lab final** will be conducted in the lab, and will include 100 specimens (fresh or photographed) to be identified by family, genus and species. Students with a perfect quiz average, including any extra credit, may be exempted from the lab final. ‌ | | |
| **15. Student learning outcome:**   * Identify, on-sight or using a hand-lens or dissecting scope, 10-20 angiosperm families.   • Learn how to properly collect, document, and process (press, dry, label, mount) a plant from the field. Toward this, each of you will prepare a collection of plants, pressed, dried, labeled, and mounted.  • have improved skills in critical, synthetic, scientific thinking and logical reasoning, are able to successfully read scientific papers and successfully write a topical review paper.  • know the identifying characteristics of the most important plant families; regionally and globally.  • know the vegetative and floral characteristics that enable identification of plants using a dichotomous key.  • Properly use the collections of the herbarium.  • Learn basic plant community surveying techniques.  • understand how ecological relationships contribute to plant species distributions in the region.  • recognize the major plant communities found in this region. | | |
| **16. Course Reading List and References‌:**  Lawrence G. H. M.1951.*Taxonomy of Vascular Plants*. New York: Macmillan. 823 pp.  Simpson, M.G., 2019. *Plant systematics.* Academic press.  Singh, G., 2019*. Plant systematics: an integrated approach.* CRC Press. Cullen, J., 2006. *Practical plant identification: including a key to native and cultivated flowering plants in north temperate regions*. Cambridge University Press.  Judd, W.S., C.S. Campbell, E.A. Kellogg, P.F. Stevens and M.J. Donoghue. 2016. Plant Systematics: A Phylogenetic Approach, 4th Ed. Sinauer Associates.  علم تصنيف النباتات: د. على حسن عيسى الموسو ى  تصنيف النباتات البذرية: يوسف منصور الكات ب | | |
| **17. The Topics:** | | **Lecturer's name** |
| **Weekl**:  Plant, Why study plant, What is systematics. **Week2**:  Taxonomy, Description, Identification, Nomenclature, Classification, Major Taxonomic Ranks or Taxa.  **Week3**:  Why study systematics, Characters used in Plant Taxonomy.  **Week4**:  Scientists of Plant Taxonomy. **Week5:**  Plant Morphology, Plant Organs, Plant habit, Plant habitat. **Week6:**  Roots, Root Types. **Week7**: Stems and shoots, Stem Types.  **Week8**: Other aerial, storage stems, Stem Habit. **Week9**: Stem Branching Pattern, Twigs and Buds. **Weekl0**: Leaves, Leaf Parts. **Week11**: Leaf Structural Types. **Week12**:Leaf Type. **Week13**: Leaf Attachment, Leaf Venation. **Week14**:Flowers, Flower Parts, Flower Sex and Plant Sex. | | Mr. Hiwa Hussein Hasan  Every lecture takes 2 hrs. |
| **18. Practical Topics (If there is any)** | | Lecturer's name |
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| **19. Examinations:**(Compositional)  **Q1**/  When you can classify any plant?  **Q2**/  What are the characters that use in plant taxonomy? **Q3**/ Did Bryophytes have roots? For any stage of plant they belong, compare them with Phanerophytes. **Q4**/ What is the fate of a bud? Reinforce your answer by a figure. | | |
| **20. Extra notes:**  **CONDITIONS:**  **Classroom and Lab Rules:** Please arrive on time for class or field trip and stay for the full period of the class. In class you may get a snack during a break, but unfortunately there is a "no eating in lab" rule because of the possibility of hazardous chemicals in the environment. During class and in the field, we always expect you to respond to the instructors and other students in a positive, respectful, and civil manner. We encourage discussion of course-related topics, but keep personal conversation to a minimum. There will be some "quiet times" when we ask everyone to stop talking and concentrate on an exercise. Please silence (completely) cell phones and close computers (unless we’re doing an exercise using computers) during class. No texting in class! (The latter can be very distracting. If you have to use your phone, please go outside.) Feel free to go to the restroom (very briefly) at any time; just try to avoid doing so during lecture and during the last half hour of lab. Please clean up your area completely at the end of class; use the hand brush (cabinet to right of front sink) as needed. Due to liability concerns, no friends, relatives, or pets can go on class fieldtrips. No smoking on campus or on any field trips; it is both discourteous to others and a potential fire hazard.  **Photography:** I wish to emphasize photography, both in the lab and on field trips. Some of you may wish to photograph plants in the field or in the lab. I will ask that you download images to add to our web page. In addition, a color print makes a nice addition to an herbarium sheet. It is important to practice, in order to get good depth of field and crisp focus; a flash is often useful. We will be teaching, and encouraging, the use of I Naturalist this term. Learning to use I Naturalist may be a class assignment. I will also encourage high magnification shots (e.g., of small flowers or flower parts) using the photo-dissecting microscope in the lab.  **Indoor labs: Be sure to bring your Manual to all the keying exercises.** You may also want to bring your lecture text on those days. If the weather looks bad on a field trip day, bring your Manual, as we may work indoors and reschedule the field trip. See our website for weather links.  **Exam Format:** All exams are closed book. Essay answers should be one or two paragraphs, be concise. Fill in blank and multiple choose questions will cover terminology and concepts. All test questions will be taken from both readings and lecture material. The use of proper grammar and spelling in your writing is mandatory and will be taken into  account when grading tests and assignments. The midterm exams will consist of the following: Essay questions 30%, Short answer 30%, Fill in the blank 20% (No word bank) and Multiple Choice 20%. The final exam and lab quizzes will be lab practical where students will identify taxa, state taxonomic characteristics for specific taxa, label structures on diagrams/specimens and define terminology.  **Corrections on Exam/Quiz Scores:** If a student finds errors in the scoring of his/her quiz, please notify the instructor within one week of the day the quiz was returned to the class. After this period, no further corrections will be made to past quizzes.  **Missing exams:** If a student has to miss an examination or quiz, she/he will have to notify the instructor a week in advance (except in the case of emergencies). Acceptable reasons for missing an exam are confining illness, death, or serious illness in the family. The instructor does not allow make-ups exams without advance notice. Outside verification is required. Arrangements for make-up tests have to be made within a week after the student returns to class.  **Academic dishonesty:** Cheating or plagiarism of any form will not be tolerated in any form.  **Field trips:** Dress to get wet, dirty, wet, buggy, wet, scratched, wet, muddy, wet, wet and wet. BE PREPARED! I strongly recommend that you wear long sleeves, long pants, and old shoes or rubber boots. **YOU MUST WEAR CLOSED SHOES** (no Teva’s, Crocs or other sandals). If you do not wear closed shoes to field labs, you will be dismissed from that lab, as an unexcused absence. Consider a hat and/or sunscreen, and you may want bug spray (**no** bug spraying in or near the van!). You should bring plenty of water and perhaps a snack. You might want to consider a head net for gnats and mosquitoes.  Have some way to record information on the species and communities that we learn (clipboard, notebook, cards, tape recorder, camera…). I will permit you to collect a small sample of most of the species we cover. You can bring clippers and a notebook or magazine to press these specimens in the field. You can also label samples with a marking pen or masking tape, keep them fresh in a plastic bag, and press them later. Most plant parts will dry within a week if pressed between several sheets of newsprint, held down with a stack of heavy books or some such.  You will find complete species descriptions in the Manual to the Vascular Flora of the Iraq, and a lot of ecosystem information in it.  I will post our species lists on the web site, including a list linking images, generally by late Monday evening after each field trip.  **Please note:** You **must** wear your seatbelt at all times when riding in the van, and no one will sit in the back seats if there are free seats to the front. These are safety issues and non-negotiable. There will be **no** smoking and **no** cell phone or other electronic device use (other than imaging) on our field trips. If you smoke, please do not smoke right before getting in the van. These restrictions are also non-negotiable.  **If you are allergic to bee stings or other venoms, please let me know immediately. You must carry medication. If you are diabetic, please set up a buddy system with a classmate.**  Some field trips may run late due to unpredictable traffic. Please schedule accordingly, and please let me know as soon as possible if late field trips are going to be a problem for you.  **Special needs:** If you will need any special accommodations to complete the requirements for this course, please contact me as soon as possible. | | |
| **21. Peer review**  I reviewed this course book and I approve its contents.  Signature:  Name: Asst. Prof. Dr. Abdul Husain M. A. Al-Khayat | | |