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**Department of Forestry**

**College of Agriculture**

**University of Salahaddin**

**Subject: Watershed Management**

**Course Book – 3rd year students**

**Lecturer's name: Payman H. Aliehsan**

**Academic Year: 2021/2022**

**Course Book**

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| **1. Course name** | **Watershed Management, theory** |
| **2. Lecturer in charge** | **Payman Hussein A.** |
| **3. Department/ College** | **Forestry**  |
| **4. Contact** |  |
| **5. Time (in hours) per week**  | **Practical: 4 hours/week**  |
| **6. Office hours** |  |
| **7. Course code** |  |
| **8. Teacher's academic profile**  | Master of Science (Master) in Agricultural and Environmental Science, Newcastle University School of Environment (England) UK, in 2012-2014. In 2015 I was starting teaching in Environment department, Science College. In 2016 I was starting teaching in Forestry department\College of Agriculture/Salahaddin University. |
| **9. Keywords** | **Watershed, Drainage basin, Stream networks, runoff** |
| **10. Course overview:** Based on this course students can learn what are the most important terms about the watershed. Students at the first lecture will learn what is watershed and the main elements of it and how can watershed area be determined by using different methods. We have managed two or three field trips in terms of watershed.  |
| 11**. Course objective:**Students are introduced to definitions of "watershed" and "watershed management" in thecontext of natural resources science and policy. There is a brief review of basic hydrology, a look at the history of watershed management, and examination of the institutions and legislation that control activities affect watershed management. We discuss threats to watershed health, sources of information to guide watershed managers, and practices that can ameliorate the threats.  |
| **12. Student's obligation**Students are required to conduct two exams in Fall semester in watershed management practical part.  |
| **13. Forms of teaching**Direct method following for teaching with student. All lectures will be explained by using PPT. software with connecting to projector. White board will be used for more explanation. A copy of hand out will give to the students to write their notes.  |
| **14. Assessment scheme**They also require bringing a PPT in this semester.All students should be presented in the lab. Quiz will be conducted every lectures with giving 5 minutes to the students. The mean of two exams will be out of (25) marks and (10) marks for Actives’ for practical part with general total (35 marks).  |
| **15. Course Reading List and References‌:*** [**https://www.tandfonline.com/doi/full/10.1080/02626667.2011.546602**](https://www.tandfonline.com/doi/full/10.1080/02626667.2011.546602)
* [**https://scholar.google.com/scholar?q=Guide+to+Hydrological+Practices&hl=ar&as\_sdt=0&as\_vis=1&oi=scholart**](https://scholar.google.com/scholar?q=Guide+to+Hydrological+Practices&hl=ar&as_sdt=0&as_vis=1&oi=scholart)
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| **16-Course program By Payman Hussein A.** |
| 1st Week | **Basics watershed hydrology** **What is a watershed?What is watershed management?Classification, types, elements of watershed**  |  |
| 2nd Week | **Delineation of watershed divide, outlet and the main stream by two methods with Arc GIS Software** |  |
| 3rd Week | **Measurement of watershed area by different methods** |  |
| 4th Week | **Field Trip**  |  |
| 5th Week | **1st  exam**  |
| 6th Week  | **Measurement of watershed perimeter by different methods and calculation of some morphometric parameters** |  |
| 7th Week | **Determination of bifurcation ratio and drainage density for a typical watershed with GIS** |
| 8th Week | **Use of Arc GIS program to determine area and perimeter of watersheds** |  |
| 9th Week | **Calculation of sediment yield in a watershed** |
| 10th Week |  **2nd Exam** |
| 11th Week |  **Calculation water demand in watershed for domestic, agricultural and other uses**  |  |
| 12th week | **Establishment of contours for planting on sloppy lands** |  |
| 13th week | **Calculate slope and height measurements** |  |
| 14th week | **Urban Stormwater Management** **Issues pertaining to watershed management in urban environments, examples of techniques to control pollution from urban stormwater** |  |
| 15th week | **Preparation of land use map using GIS** |  |

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| **17. Examinations:****Type and sample of Exam** **Q1- Complete Following sentences** **-** The size of watershed,…… and ……… of flow is determined by……...The size of watershed, speed and direction of flow is determined by land forms.**Q2- What is different between:**

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| --- | --- |
| **Geology of watershed** |  **of watershed Geography** |
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**Q3- How to delineate the boundary for a given WS?** |
| **18. 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. |
| **19. Peer review** 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).*  |