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| EXC-01-02-02A | **Form Number** | **Form:****Course Syllabus** |
| 2/3/24/2022/296305/12/2022 | **Issue Number and Date** |
|  | **Number and Date of Revision or Modification** |
| 2/3/24/2023 | **Deans Council Approval Decision Number** |
| 23/01/2023 | **The Date of the Deans Council Approval Decision** |
| 9 | **Number of Pages** |

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| **1** | **Course title** | **Farm Irrigation Management** |
| **2** | **Course number** | 644312 |
| **3** | **Credit hours (theory, practical)** | 3 |
| **Contact hours (theory, practical)** | 3 |
| **4** | **Prerequisites/corequisites** | Principles of Irrigation (604103) |
| **5** | **Program title** | Bachelor Land, Water and Environment |
| **6** | **Program code** | 4 |
| **7** | **Awarding institution**  | The University of Jordan |
| **8** | **School** | Agriculture |
| **9** | **Department** | Land, Water and Environment |
| **10** | **Level of course**  | Bachelor |
| **11** | **Year of study and semester (s)** | Semester Two 2020/2021 |
| **12** | **Final Qualification** |  |
| **13** | **Other department (s) involved in teaching the course** | - |
| **14** | **Language of Instruction** | English |
| **15** | **Date of production/revision** | 1/5/2021 |

**16. Course Coordinator:**

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| Name: Dr Fayha Al-Shibli Contact hours:-Office number: 61 Phone number: 22445Email: f.shibli@ju.edu.jo |

**17. Other instructors:**

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| N.A. |

**18. Course Description:**

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| As stated in the approved study plan.The course undertakes main definitions and components of irrigation systems starting from land preparation and planning, water storage design, conveyance system best basic designs, all management practices of irrigation, through hydraulics of applications systems and design, until defining design daily irrigation requirement and the detailed costs of irrigation system. This course will lead students to decide best selection of irrigation management practices.  |

**19. Course aims and outcomes:**

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| **A- Aims:**1. Develop a complete understanding of main concepts of farm irrigation management and functions, and the interrelations for plant-soil-water-atmosphere.
2. Develop an understanding with land & watershed management steps and runoff from watershed.
3. Develop an understanding with runoff from Watershed- Determination of peak runoff from small and large catchments.
4. Develop an understanding of sediment yield and storage capacity from watershed after rainfall event.
5. Be familiarized with latest technology of flow measurements and regulating methods.
6. Developing advanced skills for undertaking real-world farm irrigation systems.
7. Compare different irrigation systems in relation to site and situation factors and know-how to manage irrigation water practices.
8. Compute irrigation water demand, daily schedule and when to apply.
9. Be able to collect and analyses data requirements for design, water sources evaluation, determining the design daily water requirement.
10. Emphasis on the costs of operating and ownership costs for irrigation system.

**B- Intended Learning Outcomes (ILOs):** Upon successful completion of this course students will be able to:1. To understand land and watershed management practices, challenges, planning and functions on farm scale.
2. To calculate runoff and infiltration rates for small and large watershed, also the cut and fill for earthwork volumes.
3. To estimate sediments yields and erodibility of soils (relevant to field conditions), the Required storage capacity of a runoff-earthwork volume of embankment and the capacity of reservoir.
4. To know-how measuring flow under different farm conditions and how to regulate it.
5. To determine the channels and pipes dimensions and power used in conveying water.
6. Selecting the most suitable irrigation system design and familiarizing with hydroponics, hydraulics of surface irrigation and how to design border and sprinkler irrigation systems.
7. Arouse their interest to analytically interrelation the irrigation management practices under different conditions from flow measurements, flow regulators, efficient irrigation water transport, practices for erosion control, practices to use tailwater and runoff, practices for drainage management and backflow prevention.
8. Determine the irrigation water demand including domestic and livestock, when to irrigate according to indicators and new sensing techniques.
9. Understanding the primary steps in farm irrigation system design, Data Requirements for Design and to quantify the design daily irrigation requirement by frequency analysis, and irrigation adequacy.
10. Understanding the computations and interpretation of data by analysing it using the basic statistic metrics.
11. Calculate the irrigation system costs and determine the best system to select upon lowest costs and continuity.
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**20. Topic Outline and Schedule:**

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| **Topic** | **Week** | **Instructor** | **Achieved ILOs** |
| Introductory ModuleGeneral Conceptions of Irrigation Management-Irrigation management on farm-scale. | 1st week | Dr Fayha Al-Shibli | A1 |
| Plant-Soil-Atmosphere (Climatic) Relationships. Plant, Soil and Atmosphere-Functions of Farm Irrigation Systems | 2nd week | Dr Fayha Al-Shibli | A1 |
| Land and Watershed Management-watershed definitions and components-challenges of watershed management  | 3rd week | Dr Fayha Al-Shibli | A2, B1 |
| watershed functioning-naming-principles of Watershed Management- Watershed Management practices-methods of land grading-cutting and filling-estimating of earthwork volume - Watershed Management planning and approaches  | 4th week | Dr Fayha Al-Shibli | B1, B2 |
| Runoff from Watershed- Determination of peak runoff from small and large catchments  | 5th week  | Dr Fayha Al-Shibli | A3, B2 |
| runoff and Sediment Yield from Watershed- Runoff and Erosion Processes- factors affecting soil erosion-support practices- Estimation of sediment yield-measure and calculate Required storage capacity of a runoff-earthwork volume of embankment- calculate the capacity of reservoir  | 6th & 7th weeks  | Dr Fayha Al-Shibli | A4, B3 |
| Flow Measurement and Regulating Methods-open channels and pipelines- Modern Methods of Flow Measurements- Stream flow measurement and dilution methods-sound transmission and ultrasonic method  | 8th week | Dr Fayha Al-Shibli | A5, B4 |
| Types of farm irrigation systems- Diversion methods by gravity and pumps-calculate energy and power of pumps- Conveyance methods of pipelines and channels-design of irrigation Open Channel and pipeline  | 9th, 10th weeks  | Dr Fayha Al-Shibli | A6, B5  |
| Selecting the Most Suitable System Design-Classification of Water Application Methods-Sprinkle, Surface (Gravity) and Trickle irrigation (successfully used to irrigate) -delivery loss, efficient irrigation water transport, practices for erosion control, practices to use tailwater and runoff, practices for drainage management and backflow prevention. | 10th, 11th weeks | Dr Fayha Al-Shibli | A7, B6, B7 |
| Hydraulics of surface irrigation and how to design border and sprinkler irrigation systems. Hydroponics and aquaponics  | 12th week | Dr Fayha Al-Shibli | A6, B6 |

**21. Teaching Methods and Assignments:**

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| Development of ILOs is promoted through the following teaching and learning methods:1. Lectures and interactive e-meetings
2. group discussions for students’ assignments
3. Video visualization of new techniques
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**22. Course Intended Learning Outcomes:** (Upon completion of the course, the student will be able to achieve the following intended learning outcomes)

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| Course ILOs | The learning levels to be achieved |
| Remembering | Understanding | Applying | Analysing | evaluating | Creating |
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**23. Evaluation Methods and Course Requirements:**

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| Opportunities to demonstrate achievement of the ILOs are provided through the following assessment methods and requirements:

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| **Assessment Item Details** | **Weighting Percentage** |
| 1’st Assessment **Computer-based test** | **30%** |
| Group Tutorial Presentations **(during classes - 4 students per talk)** | **10%** |
| Quizzes and Homework  | **10%** |
| Final examination (17/05/2020, 9:00-11:00 a.m.)**Computer-based test** | **50%** |

1. justifications, mapping and showing cases, definitions, calculations, and phenomena explanation.
2. Assignments
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**24. Course Policies:**

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| * During pandemic, students are required to follow health procedures of wearing masks and sanitizing hands prior to classroom entry. Keep distance of not less than two meters between students’ disks.
* Regular and timely attendances are expected from all students. University regulations concerning class attendance will apply.
* Exam’s absentees can write makeup exams only if an acceptable and documented excuse is provided; for example, a medical report. Makeup exam are usually more difficult than regular exams.
* For more details on university regulations please visit: <http://www.ju.edu.jo/rules/index.htm>
* If you have any issues get in contact with me right away. Somebody is going to miss a lecture (big deal), let me know ahead of time.
* UoJ code of conduct and academic Integrity, Cheating and Plagiarism are not acceptable / the consequences as mandated by the UoJ
* Attendance is mandatory with no disturbance (*phones*).
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**25. Required equipment: (** Facilities, Tools, Labs, Training….)

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| N/A |

**26. References:**

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| Required book (s), assigned reading and audio-visuals:1. Practices of Irrigation & On-farm Water Management: Volume 2. Dr. M.H. Ali. ISBN 978-1-4419-7636-9 DOI 10.1007/978-1-4419-7637-6. Springer New York Dordrecht Heidelberg London
2. Principle of Farm Irrigation system Design (1988). Larry G. G. James. Publisher: John Wiley& Sons.

Recommended books, materials, and media:1. <https://www.youtube.com/watch?v=l_k_0hRpOA4>
2. [Dye Tracing - Flurometry - YouTube](https://www.youtube.com/watch?v=YN9LBiSYCec)
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**27. Additional information:**

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| **Notes:** * Concerns or complaints should be expressed in the first instance to the module lecturer; if no resolution is forthcoming, then the issue should be brought to the attention of the module coordinator (for multiple sections) who will take the concerns to the module representative meeting. Thereafter, problems are dealt with by the Department Chair and if still unresolved the Dean and then ultimately the Vice President. For final complaints, there will be a committee to review grading the final exam.
* For more details on University regulations please visit:

<http://www.ju.edu.jo/rules/index.htm> |

Name of Course Coordinator: Dr Fayha Al-Shibli Signature:  Date: ------------

Head of curriculum committee/Department: ----------------------------- Signature: ---------------------------

Head of Department: ------------------------------------------------------------ Signature: -----------------------

Head of curriculum committee/Faculty: ----------------------------------------- Signature: --------------------

Dean: --------------------------------------------------------- -Signature: -------------------------------------------

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| Name of the Instructor or the Course Coordinator:………………………………………………… | Signature: …………...……………… | Date: ……..………… |
| Name of the Head of Quality Assurance Committee/ Department…………………………………………………. | Signature: …………...……………… | Date: ……..………… |
| Name of the Head of Department…………………………………………………. | Signature: …………...……………… | Date: ……..………… |
| Name of the Head of Quality Assurance Committee/ School or Center…………………………………………………. | Signature: …………...……………… | Date: ……..………… |
| Name of the Dean or the Director…………………………………………………. | Signature: …………...……………… | Date: ……..………… |