Jordan University of Science and Technology
Faculty of Engineering
Civil Engineering Department

CE759 Water Resources Engineering - JNQF Level: 9
First Semester 2024-2025

Course Catalog
3 Credit Hours. The objective of this course is to introduce the students the following topics: Fields of water resources, Engineering economy in water resources planning, hydrologic statistics and probability in water resources planning, water resources systems, optimization techniques in water resources (Dynamic, linear and nonlinear programming), frequency analysis and risk calculation, forecasting and simulation techniques in water resources management. Drought management. Water demand forecasting and management
Teaching Method: On Campus

Text Book	
Title	Water Resources Engineering
Author(s)	Wurbs and James
Edition	1st Edition
Short Name	R1
Other Information	Reading

Course References

Short name	Book name	Author(s)	Edition	Other Information
R2	Applied Hydrology	Chow, V.T., Maidment, D.R., and Mays, L.W	2nd Edition	Text book
R3	Water Resources Engineering	Mays, L.W	3rd Edition	Text book
R4	Water Resources Systems Planning and Management ? An introduction to methods, models and applications	Loucks, D.P., and Eelco van Beek,	1st Edition	Reading

R5	Water Resources Systems Modeling Techniques and Analysis	Vedula, S., and Mujumdar, P.P., Water Resources Systems Modeling Techniques and Analysis, Tata McGraw Hill Pub. Co., 2005	1st Edition	Text book

Instructor	
Name	**Prof. Fayez Abdulla**
Office Location	C2 L1
Office Hours	Sun : 10:00 - 12:00 Mon : 08:00 - 10:00 Tue : 09:00 - 11:00 Wed : 08:00 - 12:00
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Class Schedule & Room

Section 1:
  Lecture Time: Wed : 13:00 - 16:00
  Room: C2009

Tentative List of Topics Covered		
Weeks	**Topic**	**References**
Week 1	Introduction, Fields of water resources and water availability	From **R1**, From **R3**, From **R4**
Weeks 2, 3	Reservoir simulation	From **R1**, From **R3**, From **R5**
Week 4	Water resources planning and development, sustainability, IWRM	From **R1**, From **R4**
Week 5	Water Resources Economics: B/C Analysis	From **R1**, From **R3**, From **R4**
Week 6	Hydrologic statistics	From **R2**
Week 7	Probability concepts in water resources	From **R2**, From **R3**
Week 8	Hydrologic design, risk analysis and uncertainties	From **R2**, From **R3**
Week 9	Streamflow forecasting and simulation	From **R2**, From **R3**, From **R5**
Week 10	Surface water resources system	From **R4**, From **R5**

Weeks 11, 12	Linear Programming Application in water resources	From **R4**, From **R5**
Weeks 13, 14	Dynamic programming Application in water resources	From **R5**
Week 15	Drought Management	From **R4**
Week 16	Water demand forecasting and management	From **R1**

Mapping of Course Outcomes to Program Outcomes and NQF Outcomes	Course Outcome Weight (Out of 100%)	Assessment method
Recognize that water resource engineers must plan for normal situations as well as extreme events to adequately protect the public at large [1L9K2]	10%	
Knowledge of the current techniques used to assess resource and impacts associated with development of specific sources of water [1L9K1]	10%	
Perform basic economic analysis to evaluate the economic feasibility of water resources and environmental engineering projects [1L9S2]	20%	
Formulate and solve deterministic optimization models for design and operation of water resources systems [1L9S1]	20%	
Ability to apply methodologies for assessing return periods associated with droughts and floods of interest [1L9S3]	20%	
Demonstrate higher level of professional skills to tackle multidisciplinary and complex problems related to water resources engineering. [1L9S3]	20%	

Relationship to Program Student Outcomes (Out of 100%)											
PI-1a	PI-2a	PI-2b	PI-2c	PI-2d	PI-3a	PI-4a	PI-4b	PI-5a	PI-6a	PI-6b	PI-7a

Relationship to NQF Outcomes (Out of 100%)				
L9K1	L9K2	L9S1	L9S2	L9S3
10	10	20	20	40

Policy	
Attendance	The students should attend all lectures
Projects and Homeworks	The students should submit all projects and homeworks

Date Printed: 2024-10-27