



**Jordan University of Science and Technology**  
**Faculty of Engineering**  
**Biomedical Engineering Department**

BME342 Bio Fluid Mechanics - JNQF Level: 7

Second Semester 2022-2023

**Course Catalog**

3 Credit Hours. 3 Credit hours (3 h lectures). This course emphasizes the application of fluid mechanics principles to major human organ systems. Principles such as the conservation of energy and mass will be applied to various human body systems in addition to fundamental equations including continuum equations and Navier Stokes equations. The course will also cover the behavior of both Newtonian and Non-newtonian physiological fluids.

**Text Book**

<b>Title</b>	Biofluid Mechanics
<b>Author(s)</b>	Rubenstein D. A., Yin W. and Frame M.D.
<b>Edition</b>	2nd Edition
<b>Short Name</b>	TEXT
<b>Other Information</b>	

**Course References**

Short name	Book name	Author(s)	Edition	Other Information
REF#1	Applied Biofluid Mechanics.	Waite L., and Fine, J.	1st Edition	
REF#2	Biofluid Mechanics	Mazmuder J.N.	1st Edition	

**Instructor**

<b>Name</b>	<b>Dr. ALA'A AL-RASHDAN</b>
<b>Office Location</b>	-
<b>Office Hours</b>	Sun : 12:30 - 14:00 Mon : 13:00 - 14:00 Tue : 13:30 - 14:30 Wed : 13:00 - 14:00 Thu : 12:30 - 14:00
<b>Email</b>	aarashdan@just.edu.jo

Class Schedule & Room	
Section 1:	Lecture Time: Mon, Wed : 11:30 - 13:00 Room: G2120
Section 2:	Lecture Time: Sun, Tue, Thu : 11:30 - 12:30 Room: M2010

Prerequisites		
Line Number	Course Name	Prerequisite Type
921010	PHY101 General Physics (1)	Prerequisite / Study
902030	MATH203 Ordinary Differential Equations	Prerequisite / Study

Tentative List of Topics Covered		
Weeks	Topic	References
Weeks 1, 2	Course Introduction	From <b>TEXT</b>
Weeks 3, 4	Fundamentals of Fluid Mechanics	From <b>TEXT</b>
Weeks 5, 6, 7	Conservation Laws	From <b>TEXT</b>
Weeks 8, 9, 10, 11	The heart and the cardiac cycle	From <b>TEXT</b>
Weeks 12, 13, 14	Blood Flow in Arteries and Veins	From <b>TEXT</b>
Weeks 15, 16	Microcirculation	From <b>TEXT</b>

Mapping of Course Outcomes to Program Outcomes and NQF Outcomes	Course Outcome Weight (Out of 100%)	Assessment method
Understand the basics and fundamentals of fluid mechanics [1L7K1]	20%	
Explain the heart and cardiac cycles [1L7K1]	20%	
Differentiate biofluid properties and behavior [1L7S1]	20%	
Apply fluid mechanics principles on biofluid flows in arteries and veins [1L7S2]	20%	
Understand microcirculation and understand the fundamental difference between physiological micro and macro-circulation [1L7S2]	20%	

Relationship to Program Student Outcomes (Out of 100%)																			
A	B	C	D	E	F	G	H	I	J	K	L	M	SLO1	SLO2	SLO3	SLO4	SLO5	SLO6	SLO7

Relationship to NQF Outcomes (Out of 100%)		
L7K1	L7S1	L7S2
40	20	40

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