



**Jordan University of Science and Technology**  
**Faculty of Science & Arts**  
**Mathematics Department**

MATH491 Special Topics In Applied Mathematics.

Summer Semester 2019-2020

**Course Catalog**

3 Credit Hours. An Introduction to the basic ideas and methods of knot theory. We introduce isotopy equivalence of knots and links and their invariance in terms of the local diagrammatic moves. Then isotopy invariants are given such as Jones polynomial via Kauffman bracket and other algebraic invariants.

**Text Book**

<b>Title</b>	The Knot Book: An Introduction to the Mathematical Theory of Knots
<b>Author(s)</b>	Colin Adams
<b>Edition</b>	5th Edition
<b>Short Name</b>	The Knot Book
<b>Other Information</b>	

**Instructor**

<b>Name</b>	<b>Prof. Saleh Abdullah</b>
<b>Office Location</b>	-
<b>Office Hours</b>	Sun : 13:00 - 14:30 Mon : 13:00 - 14:30 Tue : 13:00 - 14:30 Wed : 13:00 - 14:30
<b>Email</b>	sabdulah@just.edu.jo

**Class Schedule & Room**

Section 1:  
Lecture Time: Sun, Mon, Tue, Wed : 08:30 - 10:00  
Room: منصة الكترونية

Prerequisites		
Line Number	Course Name	Prerequisite Type
902450	MATH245 Set Theory And Logic	Prerequisite / Pass

Tentative List of Topics Covered		
Weeks	Topic	References
Week 1	Isotopy of Knots and Links	
Weeks 2, 3	Reidmeister Moves and Knot Invariants	
Week 4	Orientd Knots and Links and the Linking Number and the Writhe	
Week 4	Kauffman bracket and the X polynomial	
Week 5	Jones Polynomial and the Skein Relation	
Week 5	Three-Dimensional Manifolds and Knots and Links	
Week 6	Knots and Links in the Solid Torus and in Handlebodies	
Week 6	Singular Knots and Links	
Week 7	Invariants of Singular Knots and Links	
Week 8	Final Exams	

Mapping of Course Outcomes to Program Student Outcomes	Course Outcome Weight (Out of 100%)	Assessment method
Understand the main concepts of knot theory [1SLO1, 1SLO5]	15%	
Understand the concept of knot Invariant. [1SLO1, 1SLO5]	15%	
Understand and apply Kauffman bracket on knots and links [1SLO1, 1SLO5]	20%	
Understand and apply Jones polynomial [1SLO1, 1SLO5]	20%	
Know how to generalize knot theory to other manifolds [1SLO1, 1SLO5]	15%	
Connect knot theory to graph theory [1SLO1, 1SLO5]	15%	

Relationship to Program Student Outcomes (Out of 100%)					
SLO1	SLO2	SLO3	SLO4	SLO5	SLO6
50				50	

Evaluation	
Assessment Tool	Weight
First	30%

second	30%
final	40%

Date Printed: 2020-09-24