Math 695 (Reading & Research I)

by Jawad Abuhlail

Title: Semirings and Semimodules

Semester: 132

Rationale/Objectives: The main objective of the course is to provide the student with basic knowledge about semirings and semimodules. In particular, the differences between modules over rings and semimodules over semirings will be highlighted and discussed in details.

Learning Outcomes: By the end of this course, the student is supposed to:

a) control the definitions and the basic properties of semirings and semimodules.
b) be aware of the main differences between semirings and rings and between modules and semimodules.
c) be aware of some applications of semirings and semimodules.

Proposed Textbook:

Title: Semirings and their Applications

Authors: J. Golan

Publisher: Kluwer Academic Publishers, Dordrecht

Year: 1999

Further Reading:

M. Gondran and M. Minoux, *Graphs, Dioids and Semirings*, New models and algorithms. Operations Research/Computer Science Interfaces Series, 41. *Springer, New York*, 2008.

Syllabus

Material	Week(s)
Ch. 1: Hemirings and semirings: definitions and examples	2
Ch. 3: Building new semirings from old	1
Ch. 4: Some conditions on semirings	1
Ch. 5: Complemented elements in semirings	
Ch. 6: Ideals in semirings	1
Ch. 8: Factor semirings	
Ch. 9: Morphisms of semirings	1
Ch 10: Kernels of morphisms	
Ch 13: Additively-regular semirings	1
Mid Term Exam	
Ch 14: Semimodules over semirings	2
Ch 15: Factor semimodules	1
Ch 16: Some constructions for semimodules	1
Ch 17: Free, projective, and injective semimodules	3
Ch 18: Localization of semimodules	1
Final Exam	

Grading:

Midterm Exam	30%
Final Exam	40%
Presentations	30%