University of Manitoba, Department Statistics

STAT 7350 – Advanced Copulas
Winter 2016

CRN	25452
Instructor	Dr. Elif Acar
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Office hours	Tue Th 1:00 PM – 2:00 PM, or by appointment.
Lectures	M W F 2:30 PM–3:20 PM
	Machray Hall, room 316
	The first meeting is on **February 29, 2016**.
	The lecture time and location are subject to change after the first meeting.

Course Description

This course is a guided reading course on advanced copula models and their inference. We will review the recent literature and discuss the use of copula models in high-dimensional settings and for various problems. The focus will be on vine copula models and their inference. We will also review conditional copulas and factor copulas along with their applications.

Objectives The course will provide students with the opportunity to learn in-depth about different copula models. Throughout the course, the students will gain theoretical knowledge and practical skills necessary for the study of multivariate dependence in various contexts.

Prerequisites   STAT 4690/7200 or consent of the instructor.
A good understanding of statistical inference is essential. In addition, students are expected to have good programming skills in R for assignments and final project.

Course Material Lecture notes define the content of the course. There is no required text. A reading list of selected papers will be provided during the course.

Recommended Texts

Dependence Modelling with Copulas
H. Joe, Chapman & Hall/CRC, 2014.

An Introduction to Copulas (2nd edition)
R. Nelsen, Springer, 2006.

Multivariate Models and Dependence Concepts
H. Joe, Chapman & Hall/CRC, 1997.

Quantitative Risk Management: Concepts, Techniques, and Tools
A.J. McNeil, R. Frey, P. Embrechts, Princeton University Press, 2005.

Evaluation Grades will be based on students' performance in class discussions, assignments and final project.

Assignments	**50 %**
Final Project	**50 %**

Assignment grade will consist of reading and homework assignments. There will be regular reading assignments, some of which will involve writing a brief report on a research article. Homework assignments will require programming in R and/or real data analysis.

Final project grade will consists of a project report and an in-class presentation. Final project will require modelling dependence in real data, with possibility to include a critical analysis of a published result.

Academic Integrity
The following statement is included in this course outline to draw your attention to the academic integrity policy at the University of Manitoba.

- *Plagiarism or any other form of cheating in examinations, term tests or academic work is subject to serious academic penalty (e.g. suspension or expulsion from the faculty or university).*

It is your responsibility to understand the meaning and consequences of academic dishonesty. Therefore, please check:
http://www.umanitoba.ca/science/undergrad/resources/webdisciplinedocuments.html