

Department of Mathematics and Computer Science  
**MAE106: Discrete Mathematics with Probability**

Fall 2017/2018

**Instructor** Richard Kohar. Email: richard DOT kohar ATSYMBOL rmc DOT ca.  
Office: G341.  
Local: x 6093.

**Description** Elementary logic. Introduction to sets and operations on sets.  
Combinations and permutations. Discrete probability.

**Textbooks** *Basic Discrete Mathematics: Logic Set Theory & Probability*,  
Richard Kohar, World Scientific, 2016.

**Course Website** <https://kohar.ca/mae-106-discrete-mathematics-with-probability-fall-2017/>

**Participation** Attendance is *mandatory* for all scheduled lectures.

**Course Mark** Your final grade will be based on quizzes, tests and a three-hour final  
examination. The marks breakdown is as follows:

**Quizzes: 20%    Midterm: 30%    Final Exam: 50%**

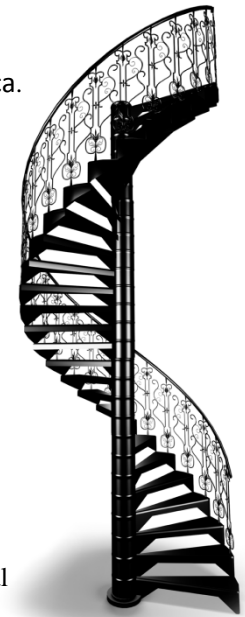
**Problem Sets** A problem set will be assigned each week. These assignments are designed to encourage  
you to keep up to date with the material. Although they will not be marked, students are  
expected to complete all problems.

**Quizzes** Normally, each problem set will be followed-up with a quiz in the following week. Each  
quiz will consist of one or two questions similar to those on the assignment. Performance  
on the quizzes will serve as an indicator of student progress, and will count for 20% of your  
final mark.

**Exams** There will be one 100-minute midterm on **19 October 2017**.

Any unauthorized absence from the test or exam may result in a mark of zero being  
awarded. Make-up quizzes or exams will not be given, so if you legitimately miss one,  
then your final mark will be calculated using the other marks and a different weighting  
scheme. A three-hour final exam will be scheduled by the Registrar's Office during the  
"Fall" examination block.

**Academic Misconduct** Academic misconduct, including plagiarism, cheating, and other violations of academic  
ethics, is a serious academic infraction for which penalties may range from a recorded  
caution to expulsion from the College. The RMCC Academic Regulations Section 23  
defines plagiarism as: "Using the work of others and attempting to present it as original  
thought, prose or work. This includes failure to appropriately acknowledge a source,  
misrepresentation of cited work, and misuse of quotation marks or attribution." It also  
includes "the failure to acknowledge that work has been submitted for credit elsewhere."  
All students should consult the published statements on Academic Misconduct contained in  
the Royal Military College of Canada Undergraduate Calendar, Section 23.



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## Course Agenda

Topic	Sections	Reference	Approximate Duration
Intro, Review and Class Admin		Handouts	1 week
Introduction to Logic	<u>Propositions and Connectives</u> <u>Truth Tables</u> <u>Laws of Logic</u> <u>Conditional and Bi-conditional Connectives</u> <u>Arguments</u>	Kohar Chap. 1 & 2	3 weeks
Sets and Counting	<u>Sets and Set Operations</u> <u>Introduction to counting</u> <u>Permutations and Combinations</u>	Kohar Chap. 3 & 5	3 weeks
Introduction to Probability	<u>Experiments, Sample Space and Events</u> <u>Probability Functions and Rules of Probability</u> <u>Use of Counting Techniques in Probability</u> <u>Conditional Probability and Independent events</u>	Kohar Chap. 8	3 weeks
Probability Distribution and Statistics	<u>Random Variables</u> <u>Expected Value</u> <u>Variance and Standard deviation</u> <u>The Binomial Distribution</u> <u>The Normal Distribution</u>	Kohar Chap. 9 & 10	3 weeks