

! " #\$%&'" #()*+&', " \$'%%-. /0'1'23456783'9:; <5<=?@'

AB'!; C:D8'*6E; :F5G; 6'

!; C:D8'*6E; :F5G; 6!!

%%-. /0'1'23456783'9:; <5<⇒?@\', 5>>'%8F8D?8:'IJIJ' Class Time & Place: Monday, Wednesday, and Friday at 12:30-1:30pm, on Zoom.

)=D?'; E'9:8:8KC=D=?8DL'+; 68!

Unless you have either the requisites for this course or written special permission from your Dean to enrol in it, you may be removed from this course and it will be deleted from your record. This decision may not be appealed. You will receive no adjustment to your fees in the event that you are dropped from a course for failing to have the necessary prerequisites.

IB'*6D?:C7?; :'*6E; :F5G; 6'

Instructor: Dr. Hristo Sendov Website: http://fisher.stats.uwo.ca/faculty/hssendov/Main.html Office: WSC 205 Phone: 519/ 661-2111 x86985 E-mail: hssendov at stats dot uwo dot ca'

Students must use their Western (@uwo.ca) email addresses when contacting their instructors. I will not reply to e-mail sent from address other than a standard university account. Please include 'SS9657' in the subject line. Please do not ask me math questions over the e-mail. It is much better to discuss mathematics in person.

Office Hours: Wednesdays 4:30-5:30pm.

MB'!; C:D8'%@>>5<CDH'%7N83C>8H'O8>=48:@'P; 38'

This is a more rigorous introduction to probability. The course is intended to be self-contained even

though some mathematical maturity is necessary, such as working freely with functions, sets, and preimages of sets. We will develop the language to understand the statements of the deeper results from measure theory and real analysis without going deep into those directions. The course will cover approximately the following topics

- -- Review of sequences and limits
- -- Measure spaces
- -- Random variables
- -- Expected value
- -- Inequalities for random variables
- -- Change of variables and Fubini's theorem
- -- Independent random variables

/B'P8?N; 3D'; E'&45>C5G; 6!

"#\$!%&\$'())!*%+',\$!-'(.\$!/0))!1\$!*()*+)(2\$.!(,!)0,2\$.!1\$)%/3!! 4%5\$/%'6,!789:!;9<!! =0.2\$'5!>?(5!!@8<! A0B()!>?(5!!CD<!

One may miss the midterm exam only for a valid reason, see below. In that case the final exam will be worth 80% of the final grade.

The homeworks will be posted on the course website OWL. Almost every Friday, I will post homework problems. The problem sets are grouped in pairs and a random question from each pair will be chosen at the end of the class on the due date. Only that question will be submitted for evaluation at the end of the class on the due date. See the dates listed below. All problems will be required for the midterm and the final exam, but the midterm and the final exam may contain new problems.

Problem Set 1	posted on September 18	
Problem Set 2	posted on September 25	HW 1&2 due on October 2
Problem Set 3	posted on October 2	
Problem Set 4	posted on October 9	HW 3&4 due on October 16
Problem Set 5	posted on October 16	
MIDTERM		sometime in the week of October 23, 2 hours
Problem Set 6	posted on October 30	HW 5&6 due on November 6
Problem Set 7	posted on November 6	
Problem Set 8	posted on November 13	HW 7&8 due on November 20
Problem Set 9	posted on November 20	
Problem Set 10	posted on November 27	HW 9&10 due on December 4
FINAL EXAM		sometime during the examination period, 2 hours

. B'277; FF; 35G; 6'563'2778DD=<⇒?@!

277; FF; 35?=; 6'9; >=7=8D!

E2+. \$B2,!/02#!. 0, (10)020\$,!/%'6!/02#!F**\$,,01)\$!>. +*(20%B!76%'5\$')H!EEI :!/#0*#!J'%&0. \$,! '\$*%55\$B. (20%B,!G%'!(**%55%. (20%B!1(,\$.!%B!5\$.0*()!.%*+5\$B2(20%B!%'!J,H*#%)%-0*()!(B.! *%-B020&\$!2\$,20B-K!''#\$!F*(.\$50*!F**%55%. (20%B!G%'!E2+.\$B2,!/02#!I0,(10)020\$,!J%)0*H!*(B!1\$!G%+B.!(23! #LJ,3MM///K+/%K*(M+B0&,\$*MJ.GM(*(.\$50*NJ%)0*0\$,M(JJ\$(),MF*(.\$50*!F**%55%. (0%BN.0,(10)00\$,KJ.G!!

27538F=7'!; 6D=38:5G; 6'E; :'%?C386?'2<D8678'

 $c\%+!5 (H!(),\%!1\$!\$)0-01)\$!2\%! / '02\$!2\#\$!EJ\$*0()!>?(5!00!H\%+!('\$!0B!(!d=+)OJ)\$!>?(5!E02+(O\%Be!7,\$\$!\#LJ3MM)) / / K^* -0,2'('K+/\%K^*(M\$?(50B(O\%B,M\$?(5N,*\#\$.+))K\#25)):K!$

XG! (!, 2+. \$B2!6(0), !2%! / '02\$! (!, *#\$. +)\$. !EJ\$*0()!>?(50B(0%B0!2#\$!. (2\$!%6!2#\$!B\$?2!EJ\$*0()!>?(50B(0%B!706! -'(B2\$.:!B%'5())H!/0))!1\$!2#\$!, *#\$. +)\$.!. (2\$!6%'!2#\$!TB()!\$?(5!2#\$!B\$?2!05\$!2#0,!*%+',\$!0,!%_\$'\$. K!''#\$! 5 (?05+5!*%+',\$!)%(.!6%'!2#(2!2\$'5!/0))!1\$!'\$. +*\$.!1H!2#\$!*'\$.02!%6!2#\$!*%+',\$7,:!6%'!/#0*#!2#\$!TB()! \$?(50B(0%B!#(,!1\$\$B!.\$6\$''\$.K!E\$\$!F*(.\$50*!Y()\$B.('!6%'!.\$2(0),!7+B.\$'!EJ\$*0()!>?(50B(0%B,:K!!

OB'27538F=7'9; ≻7=8D

 $\label{eq:solution} $$ 2, 1(B. 1$?(50B(0\%B, 10B12#0, 1*\%+', $1/0)) 1$1**\%B. +*2$. 1+, 0B-1k\%5K1c\%+1/0) 1$1**Z+0*$. 12%16$$J1H\%+'1 *(5$'(1\%B16\%'12#$1$B0'$1, $, 0\%B01#\%). 1+J1H\%+'1, 2+. $B21*('. 16\%'10. $B0T*(0\%B1J+'J\%, $, 0!(B. 1, #('$1H\%+'1, 2+. $B11/02#12#$19B&0-0)(2\%'1001(, 6$. 12\%!. \%!, \%!(2!(BH!05$1. +'0B-12#$1$?(5K!''#$1$?(5!, $, 0\%B1/0))!6; ?!1$1! $*\%'. $KI !!$

 $= \%' \$!0B6\%' 5 (0\%B! (1\%+2!2\#\$!+,\$!\%6!k\%\%5!6\%'!\$?(5!0B&0-0) (0\%B!0,!(\&(0)(1)\$!0B!2\#\$!UB)0B\$!\'\%^2\%'0B-!) j +0. \$)0B\$,!(2!2\#\$!6\%))\%/0B-!)0B63!$