STATISTICS 6802   Spring 2019

Room: Baker Systems 188   M W F   8:50AM-10:05AM

Lecturer:	Prof. Mario Peruggia - 205A Cockins Hall, 292-0963 e-mail: peruggia@stat.osu.edu
Grader:	Mr. Renxiong Liu e-mail: liu.6732@osu.edu
Text:	Casella, G. and Berger, R.L., "Statistical Inference," 2nd edition. Duxbury Press
Course Web Site:	Important announcements and course materials will be posted on the Carmen course web site at `https://carmen.osu.edu/`
Office Hours:	Peruggia: M 3:00-4:00, T 5:30-6:30, and by appointment
General objectives and coverage:	Statistics 6802 is the second half of a two-course sequence on probability and statistical inference. As in Statistics 6801, the emphasis is on a fairly rigorous theoretical development of the modeling and inferential tools needed in statistical practice and research. An important course objective is for the students to become comfortable with the formulation, conceptualization, and execution of theoretical and methodological ideas, as they relate to sound modeling and data analysis practice. The course will cover some introductory elements of Decision Theory and selected topics from Chapter 7 (Point Estimation), 8 (Hypothesis Testing), 9 (Interval Estimation), and 10 (Asymptotic Evaluation) of the textbook. A more detailed, tentative course plan is provided at the end of this document.
Homework:	Problem sets will be regularly assigned, collected, and graded. Late homework will be accepted only under exceptional circumstances.
Midterm Exam I:	The one-hour Midterm Exam I will be on Monday, February 11, in lecture.
Midterm Exam II:	The one-hour Midterm Exam II will be on Monday, March 25, in lecture.
Final Exam:	The final exam will be on Friday, April 26, 10:00am-11:45am, in the lecture classroom.
Grades:	The final numerical course grade will be determined according to the following scheme:

Homework 10%
Midterm Exam I 25%
Midterm Exam II 25%
Final Exam 40%

Rules and Policies

Academic Misconduct: It is the responsibility of the Committee on Academic Misconduct to investigate or establish procedures for the investigation of all reported cases of student academic misconduct. The term academic misconduct includes all forms of student academic misconduct wherever committed; illustrated by, but not limited to, cases of plagiarism and dishonest practices in connection with examinations. Instructors shall report all instances of alleged academic misconduct to the committee (Faculty Rule 3335-5-487). For additional information, see the Code of Student Conduct `http://studentlife.osu.edu/csc/`.

Disability Services: Students with disabilities (including mental health, chronic or temporary medical conditions) that have been certified by the Office of Student Life Disability Services will be appropriately accommodated and should inform the instructor as soon as possible of their needs. The Office of Student Life Disability Services is located in 098 Baker Hall, 113 W. 12th Avenue; telephone 614- 292-3307, slds@osu.edu; `http://slds.osu.edu`.

Cell phones: Cell phones must be either turned off or put on vibrate during class, as cell phones ringing during class disrupt the learning process.

Recording equipment: The use of any type of audio and/or visual recording equipment in the classroom is strictly prohibited. Exceptions will be made for students who need to have access to recordings of the lectures because of documented disabilities. Documentation must be obtained through the Office of Disability Services.

E-mail Correspondence: In order to protect your privacy, all course related E-mail correspondence must be done through a valid OSU "name.number" account. If you have not activated this email account, you can activate it at `https://my.osu.edu`

Tentative Course Plan

JANUARY 2019

SUBJECT __Stat 6802__   PERIOD __8:50-10:05__

	MONDAY	TUESDAY	WEDNESDAY	THURSDAY	FRIDAY	SAT/SUN
WEEK 1		1	2	3	4	5/6
notes						
WEEK 2	7 1. Point estimation. Method of moments. Maximum likelihood.	8	9 2. Maximum likelihood. Finding MLEs.	10	11 3. Maximum likelihood. Finding MLEs. Invariance.	12/13
notes	7: 1, 2		7: 2		7: 2	
WEEK 3	14 4. Bayes estimators.	15	16 5. Eval. estimators. MSE. Unbiasedness.	17	18 6. Eval. estimators. Best unbiased est.	19/20
notes	7: 2		7: 3		7: 3	
WEEK 4	21	22	23 7. Eval. estimators. Cramér-Rao. Fisher information.	24	25 8. Eval. estimators. Suff. and unbiased. Rao-Blackwell.	26/27
notes			7: 3		7: 3	
WEEK 5	28 9. Eval. estimators. Properties of UMVUEs.	29	30 10. Eval. estimators. Completeness.	31		
notes	7: 3		7: 3			
WEEK 6						
notes						

FEBRUARY 2019

	MONDAY	TUESDAY	WEDNESDAY	THURSDAY	FRIDAY	SAT/SUN
WEEK 1					**1** 11. Consistency.	**2/3**
notes					10: 1	
WEEK 2	**4** 12. Efficiency.	**5**	**6** 13. Decision theory. Introduction.	**7**	**8** 14. Decision theory. Basic concepts and definitions.	**9/10**
notes	10: 1		Various		Various	
WEEK 3	**11** Midterm 1.	**12**	**13** 15. Decision theory. Decision principles.	**14**	**15** 16. Decision theory. Bayes rules. Admissibility.	**16/17**
notes			Various		Various	
WEEK 4	**18** 17. Review and discuss solutions to Midterm 1.	**19**	**20** 18. Decision theory. Complete classes. Generalized Bayes rules.	**21**	**22** 19. Hyp. testing. Def's. LRT (decision theory motivation)	**23/24**
notes			Various		8: 1, 2. Various	
WEEK 5	**25** 20. Hyp. testing. LRT examples. LRT and sufficiency.	**26**	**27** 21. Hyp. testing. LRT & nuisance param's. Bayesian tests.	**28**		
notes	8: 2		8: 2			
WEEK 6						
notes						

MARCH2019

	MONDAY	TUESDAY	WEDNESDAY	THURSDAY	FRIDAY	SAT/SUN
WEEK 1					1 22. Hyp. testing. Power function.	2/3
notes					8: 3	
WEEK 2	4 23. Hyp. testing. Normal samples examples.	5	6 24. Hyp. testing. p-values. Fisher's exact test.	7	8 25. Hyp. testing. Most powerful tests. Neyman-Pearson lemma.	9/10
notes	8: 3		8: 3		8: 3	
WEEK 3	11	12	13	14	15	16/17
notes						
WEEK 4	18 26. Hyp. testing. UMP tests: examples and discussion. Bayes tests	19	20 27. Hyp. testing. Hybrid classical/ Bayesian. MLR. Karlin-Rubin Thm.	21	22 28. Hyp. testing. Ex's of existence and non-existence of UMP tests.	23/24
notes	Various		8: 3. Various		8: 3	
WEEK 5	25 Midterm 2.	26	27 29. Hyp. testing. UMP unbiased tests. Generalized N-P lemma.	28	29 30. Hyp. testing. Philosophical distinctions. Large sample tests.	30/31
notes			8: 3. Various		10: 3. Various	
WEEK 6						
notes						

APRIL 2019

MONDAY	TUESDAY	WEDNESDAY	THURSDAY	FRIDAY	SAT/SUN
1 31. Review and discuss solutions to Midterm 2.	**2**	**3** 32. Large sample tests. LRT, Wald tests.	**4**	**5** 33. Large sample tests. Score tests. Interval estimation. Introduction.	**6/7**
notes:		10: 3		10: 3. 9: 1	
8 34. Interval estimation. Coverage prob. Construction by inversion.	**9**	**10** 35. Interval estimation. Construction by inversion. Pivoting.	**11**	**12** 36. Interval estimation. Pivoting ex's. Bayesian intervals	**13/14**
notes: 9: 1, 2		9: 2		9: 2	
15 37. Interval estimation. Evaluation of est's.	**16**	**17** 38. Test related optimality. Approx. intervals.	**18**	**19** 39. Approx. intervals. Prediction intervals. Tolerance intervals.	**20/21**
notes: 9: 3		9: 3. 10: 4		10: 4. 11: 3	
22 40. Rank-based hypothesis testing.	**23**	**24**	**25**	**26**	**27/28**
notes: Various					
29	**30**				
notes:					
notes:					

Week 1, Week 2, Week 3, Week 4, Week 5, Week 6