

SPR 16 VPH
2/9/16
MR

COURSE PROPOSAL ROUTING SHEET

151650

2nd Bulletin 2.25.16

New Course

Revision

Course Prefix and Number

ACM 604

Note:

A course revision requires that a copy of the old proposal be submitted with the new proposal.

Course Abbreviation

Topics Statis Infer

Course Title

Topics in Statistical Inference

Intellectual Foundations (IF)

IF Infused (INF)

Requested IF or INF Area(s)

Schedule Type

Lecture

Course Offered

Fall Semester Only

1st Offering

Next Fall

Credit Hour Type

Standard Credit Hours

Repeatable

Yes No

Departmental Action

Approved with confirmation that all necessary laboratories, studios, resources, facilities, and personnel for support of this course are available

Bruce Sun 11/25/2015
Dept. Curriculum Chair Date

If cross-listed, both Department Chairs must sign

Houglang Lu 11/30/15
Department Chair(s) Date

Email Address of Department Contact for Notification

xuh@buffalostate.edu

School Action

Approved with confirmation that all necessary laboratories, studios, resources, facilities, and personnel for support of this course are available

School Curriculum Chair Date
Karen O'Leary 12/1/15
School Dean(s) Date

If cross-listed, both Schools' Deans must sign

College Senate Action

Received, logged, and electronic packet and hard copies forwarded to the College Senate Office. Course title and description submitted to the College Bulletin.

Timothy Hagan 12/2/15
College Senate Office Date

Course Log Number

151650

Intellectual Foundations

Approved

Disapproved

Assistant Dean, Intellectual Foundations

Date

Senate Curriculum Committee

Approved

Disapproved

Senate Curriculum Committee Chair

Date

Administrative Action

Office of Academic Affairs

Approved

Disapproved

Office of Academic Affairs

Date

Mr. Luo 2/25/16
Date

Prefix, Number and Name of Course: ACM 604 Topics in Statistical Inference

Credit Hours: 1

In Class Instructional Hours: 1 **Labs/Studio:** 0 **Field Work:** 0

Catalog Description:

Prerequisites: Instructor permission.

Topics include continuous distributions, sampling distributions, point and interval estimation, and tests of hypotheses. Offered occasionally.

Reasons for Addition:

To make available a one-credit course in statistical inference that supports students in acquiring foundational knowledge required for success in the statistics courses of the PACM program.

Student Learning Outcomes: Students will:	Content Reference:	Assessment:
1. Demonstrate an understanding of the principles, tools and techniques of statistical inference.	I, II, III	Group and individual assignments and examinations.
2. Decompose and analyze the theoretical methods for solving real-world statistical problems.	I, II, III	Group and individual assignments and examinations.
3. Demonstrate the relationship between the fundamentals of probability and statistics to make decisions in the face of uncertainty.	I, II	Individual assignments and examinations
4. Apply models and solve problems by applying the key theorems, tools and techniques in statistics.	I, II, III	Individual assignments and examinations

Course Content:

- I. Fundamental sampling distributions and data descriptions
 - A. Random sampling
 - B. Sampling distributions of means and the Central Limit Theorem
 - C. Sampling distributions of sample variance
 - D. T-Distribution and F-Distribution
- II. One- and Two-sample estimation problems
 - A. Statistical inference
 - B. Classical methods of estimation
 - C. Estimating the mean and standard errors
 - D. Estimating the difference between two means
 - E. Estimating the proportions and the difference between two proportions

- F. Estimating the variance and the ratio of two variance
- III. One- and Two-sample tests of hypotheses
- A. General statistical hypotheses
 - B. The use of P-values for decisions in hypotheses
 - C. Tests concerning a single mean and two means
 - D. Choice of sample size for testing means
 - E. Test on a single proportion and two proportions
 - F. One- and Two-sample tests concerning variances

Resources

Scholarship:

Brownlee, K. A., *Statistical Theory and Methodology: In Science and Engineering*, 2nd. New York: John Wiley & Sons 1988.

Chung, K. and AitSahlia, F., *Elementary Probability Theory: With Stochastic Processes and an Introduction to Mathematical Finance*, 2008.

Devore, J. L., *Probability and Statistics for Engineering and the Sciences*, 6th. Belmont, Calif: Duxbury Press, 2003.

Hodges, J. L. and Lehmann, *Basic Concepts of Probability and Statistics*, 2nd. Philadelphia: Society for Industrial and Applied Mathematics, 2005.

Hogg, R. V. and Craig, A., *Introduction to Mathematical Statistics*, 6th, Upper Saddle River, N. J.: Prentice Hall, 2005.

Larsen, R. J., and Morris, M. L., *An Introduction to Mathematical Statistics and Its Applications*, 3rd. Upper Saddle River, N. J.: Prentice Hall, 2000.

Montgomery, D. C., *Design and Analysis of Experiments*, 7th, Upper Saddle River, N. J.: Prentice Hall, 2008.

Montgomery, D. C., *Introduction to Statistical Quality Control*, 6th, Upper Saddle River, N. J.: Prentice Hall, 2008.

Ott, R. L. and Longnecker, M. T., *An Introduction to Statistical Methods and Data Analysis*, 5th, Boston: Duxbury Press, 2000.

Ross, S. M., *Introduction to Probability Models*, 9th, New York: Academic Press Inc., 2002.

Steel, R. G. D., Torrie, J. H. and Dickey, D. A., *Principles and Procedures of Statistics: A Biometrical Approach*, 3rd, New York: McGraw-Hill, 1996.

Winer, B. J., *Statistical Principles in Experimental Design*, 3rd, New York: McGraw-Hill, 1991.

Periodicals:

Annals of Applied Statistics
Journal of the American Statistical Association
Journal of Applied Probability
Journal of Applied Statistical Science
Journal of Data Science
Journal of Forecasting
Journal of Probability and Statistical Science
Journal of Statistical Theory and Applications
Mathematical Methods of Statistics
Probability and Mathematical Statistics
SIAM Journal on Scientific and Statistical Computing
The American Statistician
The Annals of Statistics
Theory of Probability and Mathematical Statistics

Electronic and/or Audiovisual Resources:

- [Chris Chatfield's book](#)
- [Cod Catch Excel File](#) ; [Themostat Excel File](#).
- <https://www.coursera.org/course/statinference>
- <https://www.youtube.com/watch?v=89kzdOC8xEE>
- <https://www.youtube.com/watch?v=WkOinijQmPU>.
- <https://www.youtube.com/watch?v=Nft68uZaois>.

