



**University of Manitoba**  
**Faculty of Science**  
**Department of Statistics**  
**STAT 7290 (A01) Winter 2020**  
**Instructor: Professor Xikui Wang**

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## 1 Course Details

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<b>Course Title and Number:</b>	Statistical Consulting, STAT 7290 (A01), CRN 57033
<b>Number of Credit Hours:</b>	3
<b>Class Times, Days of Week:</b>	10:00 am - 11:15 am, Tuesdays and Thursdays
<b>Location for classes:</b>	316 Machray Hall
<b>Course Material:</b>	All course materials are posted on UMLearn web
<b>Pre-Requisites:</b>	Consent of Department

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## 2 Instructor Contact Information

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<b>Instructor Name:</b>	Dr. Xikui Wang
<b>Position:</b>	Associate Dean, Faculty of Graduate Studies (Professor of Statistics)
<b>Office Location:</b>	500 University Centre
<b>Office Hours:</b>	Tuesdays and Wednesdays 1:30 pm - 3:00 pm; or by appointment
<b>Contact:</b>	204-474-9511, <a href="mailto:xikui.wang@umanitoba.ca">xikui.wang@umanitoba.ca</a>
<b>Note:</b>	I often have meetings. Please call or email to confirm appointment.

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### 3 General Course Information

The role of a statistics consultant.

This is a non-traditional course to build skills of collaboratively investigating interdisciplinary research problems and communicating (in writing and orally) statistical results with laymen. We discuss the interaction between statisticians and clients (researchers, scientists, business people, etc.) and the role of statistics consultants. The overarching goal is to provide basic ideas of statistical consulting and some fundamental skills of providing effective statistical consulting service. The emphasis is on enhancing useful techniques and skills of developing comprehensive and creative approaches to real world problems involving statistical uncertainty.

Critical thinking and problem solving are required. Knowledge of fundamental probability techniques and statistical methods are essentially important. Course work will involve discussing relevant issues in classes, formulating approaches to practical problems, cleaning, organizing and analyzing data, writing statistics reports, and communicating ideas and results in writing and orally.

### 4 Course Goals and Intended Learning Outcomes

The goal is to develop and enhance some skills to succeed as a statistical consultant (doing the right things and doing things right): assessing your role, utilizing your statistics expertise, applying non-statistical skills, and communicating statistical ideas and results.

- **proper judgement and problem formulation:** formulate general research goals and specific statistics objectives, understand research problems, verify fundamental assumptions for their plausibility, investigate important (methodological, practical, computational and logistic) issues, determine the scope of research problems, clean, organize and analyze data, identify the challenges faced by and the role played by the statistics consultant;
- **analytic and computing skills:** choose the philosophic approach (Bayesian, frequentist), identify the statistical models and specific statistical methods required, determine the statistics software and packages needed, break down the research problems with gradually evolving conditions;
- **comprehension and generalization:** see the forest from the trees, learn by analogy, and generalize ideas and draw methods about other cases from related examples;
- **critical thinking and right reasoning:** critically appraise and compare the strengths and limitations of different methods (“all that glitters is not gold!”), elaborate on the pros and cons of the statistical approaches and results, as well as their logistic limitations and practical constraints;
- **effective (written and oral) communication and interpersonal skills:** communication is the lifeblood of successful consulting, respect each other, clarify non-statistical jargons by asking appropriate questions, maintain research integrity and ethics standards, exercise good statistical practice and project management skills.

Upon completing the course, we hope you become skillful in applying statistical and non-statistical skills and are prepared to take the challenges as a potential statistical consultant.

## 5 Recommended Reading Materials

- J. Spurrier. *The practice of statistics: putting the pieces together*, Duxbury Press, 1999.
- J.R. Boen and D.A. Zahn, *The human side of statistical consulting*, Research Methods Series, Lifetime Learning Publications, 1982.
- J. Derr, *Statistical consulting: a guide to effective communication*, Duxbury Thomson Learning, 2000.
- J. Cabrera and A. McDougall, *Statistical consulting*, Springer, 2002.
- D.J. Hand and B. Everitt, *The statistical consultant in action*, Cambridge University Press, 1987.
- G.J. Hahn and N. Doganaksoy, *A career in statistics - beyond the numbers*, Wiley, 2011.
- R.R. Newton and K.E. Rudestam, *Your Statistical Consultant*, (Second Edition), Sage, 2013.

## 6 Course Evaluation and Grading

Classroom participation:	5%	(Attendance and engagement)
Four Assignments:	40%	(Due: Jan. 30 / Feb. 13 / Mar. 5 / Mar. 19, 2020)
Project Data Analysis:	20%	(Due: March 24, 2020 before 12 noon)
Project Final Report:	20%	(Due: March 31, 2020 before 12 noon)
Project Presentation:	15%	(April 2, 2020)

Grading system:

Letter Grade	A+	A	B+	B	C+	C	D	F
Final % mark	90-100	80-89	75-79	70-74	65-69	60-64	50-59	Less than 50

## 7 Some Important Dates

- **First class:** Tuesday January 7, 2020
- **Course drop date:** January 17, 2020
- **Winter term break:** February 17 - 21, 2020 (no classes)
- **Voluntary withdrawal deadline:** March 18, 2020
- **Data analysis of consulting project:** March 19, 2020
- **Final report of consulting project:** March 31, 2020
- **Graduate student group presentations:** April 2, 2020

## 8 Expectations: CARE

I expect you to maintain academic integrity and provide CARE (Collaboration/Commitment, Attitude/Attention, Review/Research, Exploration/Engagement).

You can expect me to provide CARE (Courage, Aspiration, Resource, Enthusiasm), dispel doubts, and most importantly, **inspire** you. I love teaching and the meaning of my teaching is to help you find the meaning of learning. My true success is helping you to succeed.

## 9 Academic Integrity and Student Accessibility Services

Links to resources that describe academic dishonesty can be found at the following links. It is important that you understand what constitutes academic dishonesty and that you are familiar with the very serious consequences.

[http://www.umanitoba.ca/student/resource/student\\_advocacy/academicintegrity/students/a-to-i-what-is-academic-integrity.html](http://www.umanitoba.ca/student/resource/student_advocacy/academicintegrity/students/a-to-i-what-is-academic-integrity.html), and

[http://www.umanitoba.ca/student/resource/student\\_advocacy/academicintegrity/students/student-academic-misconduct-faq.html](http://www.umanitoba.ca/student/resource/student_advocacy/academicintegrity/students/student-academic-misconduct-faq.html).

If you are a student with a disability, please contact the Student Accessibility Services (SAS) for academic accommodation supports and services such as note-taking, interpreting, assistive technology and exam accommodations. Students who have, or think they may have, a disability (e.g. mental illness, learning, medical, hearing, injury-related, visual) are invited to contact SAS to arrange a confidential consultation. For Student Accessibility Services, see <http://umanitoba.ca/student/saa/accessibility/>, 520 University Centre, (204) 474-7423, [student\\_accessibility@umanitoba.ca](mailto:student_accessibility@umanitoba.ca)

## 10 Using Copyrighted Materials

Please respect copyright and we will use copyrighted content in this course. All course notes, assignments, tests, exams, practice exams and solutions are the intellectual property of your instructor or the Department of Statistics. Reproduction or distribution of these materials is strictly forbidden without their consent. For more information, see the University's Copyright Office website at [http://umanitoba.ca/copyright/orcontactum\\_copyright@umanitoba.ca](http://umanitoba.ca/copyright/orcontactum_copyright@umanitoba.ca).

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**Happy Statistical Consulting!**