UNSW AUSTRALIA

COURSE OUTLINE

Never Stand Still | Science | School of Mathematics and Statistics

MATH3831

Statistical Methods for Social and Market Research

Semester 1, 2016

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MATH3831 – Course Outline

1 Information about the course

Course Name: Statistical Methods for Social and Market research
Level of Course: 3rd year UG, elective
UOC: 6
Prerequisites: MATH2801/MATH2901
Contact hours: 4hrs/week × 12 weeks
Summary course structure:

	Time	Venue
Lectures	Tue 10:00-12:00 (Weeks 1-12)	RC M010
	Thu 10:00-11:00 (Weeks 1-12)	OMB G32
Tutorials	Thu 11:00-12:00 (Weeks 2-13)	OMB G32

2 Staff involved in the course

Course Convener: Dr. F. Chen, RC-1031, feng.chen@unsw.edu.au;
Consultation hours: Tue 14:00-15:00, Weeks 2-13.

3 Course aims

This course aims to develop skills important for the design and analysis of research in the social sciences and in market research. Specific focus will be on developing skills for survey sampling, and questionnaire design and analysis.

Relation to other courses and relevant programs
This is an elective applied statistics course in a statistics major. It builds on foundation knowledge of statistical inference (MATH2801/2901) and will provide a solid background in applied statistics when studied in a program including MATH2831, MATH3811, MATH3821 and MATH3851.

4 Student Learning Outcomes

By the end of this course a student should be able to:

1. describe the common sampling strategies, and recognise them from a description of how a survey was done;
2. identify which sampling strategy is appropriate for a given context;

3. estimate key population parameters of interest and measures of uncertainty, for a given sampling strategy;

4. appreciate important issues in questionnaire design, develop appropriate questionnaires, and critique a given questionnaire;

5. generate and interpret computer output for questionnaire analysis, factor analysis and cluster analysis.

Relation to graduate attributes
The above outcomes are related to the development of the Science Faculty Graduate Attributes, in particular: 1. **Research, inquiry and analytical thinking abilities**, 4. **Communication**, 5.**Teamwork, collaborative and management skills**, and 6. **Information literacy**.

5 Teaching strategies underpinning the course

Lecture notes provide a brief reference source for this course. New ideas and skills are first introduced and demonstrated in lectures, then students develop these skills by applying them to specific tasks in tutorials and assessments. Computing skills are developed by performing the assignment tasks. Assessment in this course will use problem-solving tasks of a similar form to those practiced in tutorials, to encourage the development of the core analytical and computing skills underpinning this course and the development of analytical thinking.

Rationale for learning and teaching strategies
We believe that effective learning is best supported by a climate of inquiry, in which students are actively engaged in the learning process. Hence this course is structured with a strong emphasis on problem-solving tasks in tutorials and in assessment tasks, and students are expected to devote the majority of their class and study time to the solving of such tasks.

6 Assessment

Assessment in this course uses problem-solving tasks of a similar form to those practiced in tutorials and laboratories, to encourage the development of the core analytical and computing skills underpinning this course and the development of analytical thinking. The assessment consists of two take-home assignments (weighing 10% and 20% toward the total mark respectively), one mid-term test (20%) and a final exam (50%).

6.1 Assignments

Rationale - The take-home projects in this course will involve data collection elements such that you can develop skills in choosing appropriate sampling designs and designing questionnaire studies (key learning outcomes 2 and 4, respectively). These projects involve computing components, to assess your development of key computing skills.

Assignment 1 assesses Learning Outcomes 1-3. Assessment criteria include: 1. correct identification of sampling design, 2. use of an appropriate sampling design, and 3. correct estimation of parameters/uncertainty. Date of release: Wednesday lecture, Week 1; date of submission: Friday 5pm, Week 5.

Assignment 2 is a group project. Working in groups of 5 or more members, students will design a questionnaire on a topic chosen from a given set of topics, collect data using the questionnaire, analyse the data, and write a project report. The questionnare and the project report shall both be submitted as group work, at different due times. This assignment assesses Learning Outcomes 4-5. The assessment criteria include: 1. appropriateness of questionnaire questions, 2. implementation of questionnaire design ideas, 3. valid criticisms of questionnaire design and data collection, 4. correct analysis and appropriate interpretation of results, 5. ability to work effectively as a team. Date of release: Wednesday lecture, Week 8; date of questionnaire submission: Friday 5pm, Week 10; date of project report submission: Friday 5pm, Week 13.

Late assignments will not be accepted, unless an acceptable excuse (with evidence) is presented. Students must be aware of the School's rules for assignments; see the page http://www.maths.unsw.edu.au/currentstudents/rules-assignments.

6.2 Exams

Rationale: Exams allow students to individually demonstrate their achievement of the course outcomes under controlled conditions independent of assistance from others.

A midterm test will happen in Week 7 Thursday lecture time, 21/04/2016 10:00-11:00. It assesses Learning Outcomes 1-3. Bring your own UNSW approved calculator. The test counts 20% toward the total mark of this course.

The final exam assesses all the learning outcomes of this course, weighing 50% in the total mark. The duration of the exam is two hours. Further details about the exam will be available closer to the time.

Students who miss an exam will receive 0 marks unless they request special consideration in accordance with university guidelines. See http://www.maths.unsw.edu.au/currentstudents/special-consideration-illness-misadventure.

7 Course Schedule

Week	topic	useful reference (see textbook list)
1	Approaches to sample survey design, Simple random sampling	L, chapters 1 & 2
2	Estimation of Ratio and difference	L, Chapters 2 & 3
3	Estimation using auxiliary information	L, Chapter 3
4	Systematic sampling	L, Chapter 5
5	Stratified sampling. Poststratification. Ratio estimation under stratified sampling.	L, Chapters 4 & 6
6	Sampling with unequal probabilities. Single-stage cluster sampling, two-stage cluster sampling	L, Chapter 5
7,8	Questionnaire design	B, Chapter 9
9	Attitude measurement	B, Chapter 5
10	Scale construction, reliability, validity	B, Chapters 5 & 6
11	Factor analysis	H, Chapter 7
12	Cluster analysis	H, Chapter 8

The above schedule should be considered as a guide only, as it might not be strictly followed.

8 Additional resources and support

8.1 Textbooks

Survey sampling references:
L: Lohr, S. Sampling: Design and Analysis, Duxbury Press, 1999. P 519.52/6 Level 2 Reserve. (recommended)
S: Scheaffer, R., Mendenhall, W., Ott, L. Elementary Survey Sampling. Fifth edition, Duxbury Press, 1996. P 519.52/5 Level 2 Reserve.
Questionnaire dsign and analysis references:
B: Babbie, E. R. The Practice of Social Research. Eleventh edition, Wadsworth, 2007. (How to pose survey questions.) S 300.72/58 Level 2 Reserve.
H: Hair, Anderson, Tatham, Black. Multivariate Data Analysis. Six edition, Prentice-Hall, 2006. S 519.9/547. (factor/cluster analysis.)

8.2 Lecture notes

These will be provided on Moodle the week before the lecture.

8.3 Moodle

All course materials will be available on Moodle. You should check regularly for new materials.

9 Course Evaluation and Development

The School of Mathematics and Statistics evaluates each course each time it is run. We carefully consider the student responses and their implications for course development. It is common practice to discuss informally with students how the course and their mastery of it are progressing.

10 Administrative matters

Expectations of Students, assessment policies	Important information for students (including rules and expectations for attendance, release of marks, additional assessment) is available from http://www.maths.unsw.edu.au/currentstudents/assessment-policies
Occupational Health and Safety	See http://www.gs.unsw.edu.au/policy/documents/ohspolicy.pdf for UNSW Occupational Health and Safety policies and expectations of students regarding health and safety.
Equity and Diversity	Those students who have a disability that requires some adjustment in their teaching or learning environment are encouraged to discuss their study needs with the course Convenor prior to, or at the commencement of, their course, or with the Equity Officer (Disability) in the Equity and Diversity Unit (9385 4734 or http://www.studentequity.unsw.edu.au/). Issues to be discussed may include access to materials, signers or note-takers, the provision of services and additional exam and assessment arrangements. Early notification is essential to enable any necessary adjustments to be made.
Grievance Policy	First, see your course authority! If resolution is not possible, then follow the procedures listed on the page https://student.unsw.edu.au/complaints

11 Plagiarism and academic honesty

Plagiarism is the presentation of the thoughts or work of another as ones own. Issues you must be aware of regarding plagiarism and the universitys policies on academic honesty and plagiarism can be found at https://student.unsw.edu.au/plagiarism.