Course Outline

Code: PUB701
Title: Epidemiology and Biostatistics

School: Health & Sport Sciences
Teaching Session: Semester 1
Year: 2019
Course Coordinator: Dr Mary Kynn Phone: 07 5430 2839 Email: mkynn@usc.edu.au
Course Moderator: Dr Rachel Cole Phone: 07 5459 4656 Email: rcole@usc.edu.au

Please go to the USC website for up to date information on the teaching sessions and campuses where this course is usually offered.

1. What is this course about?

1.1 Course description

This is an advanced course to develop specialised skills in epidemiology and biostatistics. You will design epidemiological studies to answer research questions, and collect, analyse and report on quantitative data. You will develop mastery in applying epidemiological and biostatistical concepts, critically analyse, reflect on and synthesise complex epidemiological research findings relevant to your professional area.

1.2 Course topics

Measures of health
Epidemiological study designs, bias, confounding, and concepts of causation
Simple sample size calculations
Data collection strategies
Analytical techniques in epidemiology, inferential techniques for categorical variables, non-parametric statistics, and regression

2. What level is this course?

700 level Specialised - Demonstrating a specialised body of knowledge and set of skills for professional practice or further learning. Advanced application of knowledge and skills in unfamiliar contexts

3. What is the unit value of this course?

12 units

4. How does this course contribute to my learning?

Specific Learning Outcomes On successful completion of this course, you should be able to:	**Assessment tasks** You will be assessed on the learning outcomes in task/s:	**Graduate Qualities or Industry Standards mapping** Completing these tasks successfully will contribute to you becoming:
Formulate hypotheses that can be addressed through epidemiological investigations	Task 2: Epidemiological study poster	Creative and critical thinkers.
Identify and apply techniques to reduce bias and control for confounding at the design and analysis phases of an epidemiological study.	Task 3: Examination	Creative and critical thinkers.
Collect and critically appraise information about epidemiological research designs and statistical analysis, to draw conclusions about public health significance	Task 2: Epidemiological study poster Task 3: Examination	Empowered.
Design and conduct a biostatistical analysis and produce a report.	Task 2: Epidemiological study poster	Empowered.
Identify and describe characteristics of, define terminology associated with, and calculate measures relevant to, the epidemiological approach.	Task 1: On-line activities Task 3: Examination	Knowledgeable.

5. Am I eligible to enrol in this course?

Refer to the USC Glossary of terms for definitions of "pre-requisites, co-requisites and anti-requisites".

5.1 Enrolment restrictions

Nil

5.2 Pre-requisites

PUB708 and enrolled in SC713 OR enrolled in SC711 or SC740 or SC611 or ED705

5.3 Co-requisites

Nil

5.4 Anti-requisites

CPH361 or PUB761 or PUB361

5.5 Specific assumed prior knowledge and skills (where applicable)

Basic mathematical and statistical skills are assumed

6. How am I going to be assessed?

6.1 Grading scale

Standard – High Distinction (HD), Distinction (DN), Credit (CR), Pass (PS), Fail (FL)

6.2 Assessment tasks

Task No.	Assessment Tasks	Individual or Group	Weighting %	What is the duration / length?	When should I submit?	Where should I submit it?
1	Project support activities	Individual and group	10% individual 10% group	N/A	Monday 10am Weeks 2, 3, 7, 11, 12	Blackboard
2	Epidemiological poster	Group	35%	1200-1500 words	Monday Week 13	Blackboard
3	Exam	Individual	45%	2 hrs	Central examination period	In person
			100%			

Assessment Task 1: On-line activities

Goal:	To advance your knowledge and skills in applying foundational concepts relevant to epidemiological and biostatistical approaches.
Product:	On-line activities including simulations, data collection and quizzes
Format:	• Various
Criteria:	You will be assessed on your ability to: • Identify and describe characteristics of, define terminology associated with, collect data and calculate measures relevant to, the epidemiological and biostatistical approach. • Critically appraise information about epidemiological research designs and statistical analysis to draw conclusions about public health significance.

Generic skill assessed	**Skill assessment level**
Problem solving	Specialised

Assessment Task 2: Epidemiological study poster

Goal:	To apply key biostatistical concepts to collect, organise and analyse data for the research proposal
Product:	A3 poster
Format:	• A3 poster suitable for a scientific audience. Refer to Blackboard for format and details
Criteria:	You will be assessed on your ability to: • Formulate hypotheses that can be addressed through epidemiological investigation. • Plan and conduct a biostatistical analysis and produce a scientific poster to communicate the results.

Generic skill assessed	**Skill assessment level**
Problem Solving	Specialised
Applying technologies	Specialised
Communication	Specialised

Assessment Task 3: Examination

Goal:	To apply your advancing skills of biostatistics and epidemiology to deconstruct papers and extracts, interpret statistical results, assess epidemiological research designs, as well as identifying the foundational concepts relevant to epidemiological and biostatistical approaches.
Product:	Exam
Format:	• Open book • Calculator required • Two hours • Mix of short answer and multiple choice questions
Criteria:	• Identify and apply techniques to reduce bias and control for confounding at the design and analysis phases of an epidemiological study. • Critically appraise information about epidemiological research designs and statistical analysis, to draw conclusions about public health significance. • Identify and describe characteristics of, define terminology associated with, and calculate measures relevant to, the epidemiological approach.

Generic skill assessed	**Skill assessment level**
Problem Solving	Specialised
Information literacy	Specialised

7. How is the course offered?

7.1 Directed study hours

13 weeks of blended delivery, inclusive of 10 x 2 hour computer labs across the semester

7.2 Teaching semester/session(s) offered

Online: Semester 1
Southbank: Semester 1

7.3 Course activities

Teaching Week / Module	What key concepts/content will I learn?	What activities will I engage in to learn the concepts/content?	
		Directed Study Activities	Independent Study Activities
1	Introduction to epidemiological concepts, measuring disease frequency	Lecture, computer lab activities or on-line activities	Readings and/or on-line activities via Blackboard
2	Study designs and ethical principals	Lecture, on-line activities	Readings and/or on-line activities via Blackboard
3	Linking exposure and disease	Lecture, computer lab activities or on-line activities	Readings and/or on-line activities via Blackboard
4	Sampling, error, power & significance, Chi-squared test of independence	Lecture, on-line activities	Readings and/or on-line activities via Blackboard
5	Bias, error and confounding	Lecture, computer lab activities or on-line activities	Readings and/or on-line activities via Blackboard
6	Reading and writing epidemiological papers Understanding descriptive and inferential statistics	Lecture, on-line activities	Readings and/or on-line activities via Blackboard

7	Analytical techniques for comparing data in two groups: t-test and Mann-Whitney U test	Lecture, computer lab activities or on-line activities	Readings and/or on-line activities via Blackboard
8	Analytical techniques for comparing data in more than two groups: ANOVA and Kruskal-Wallis test	Lecture, on-line activities	Readings and/or on-line activities via Blackboard
9	Association and causation, analytical techniques for evaluating associations between two continuous variables; correlation and regression; multiple regression	Lecture, computer lab activities or on-line activities	Readings and/or on-line activities via Blackboard
10	Analytical techniques for evaluating associations between two categorical variables, Chi-squared test and logistic regression	Lecture, on-line activities	Readings and/or on-line activities via Blackboard
11	Association and causation; critically reviewing evidence.	Lecture, computer lab activities or on-line activities	Readings and/or on-line activities via Blackboard
12	Disease prevention	Lecture, on-line activities	Readings and/or on-line activities via Blackboard
13	Screening programmes	Lecture, computer lab activities or on-line activities	

Please note that the course activities may be subject to variation.

8. What resources do I need to undertake this course?

Please note that course information, including specific information of recommended readings, learning activities, resources, weekly readings, etc. are available on the course Blackboard site. Please log in as soon as possible.

8.1 Prescribed text(s)

Please note that you need to have regular access to the resource(s) listed below:

Author	Year	Title	Publisher
Webb, P and Bain, C.	2011 or 2016	*Essential Epidemiology: An introduction for students and health professionals*. Edition 2 or 3	Cambridge, Melbourne.

8.2 Required and recommended readings

- Bruce, N., Pope, D. and Stanistreet, D. (2008). *Quantitative Methods for Health Research: A practical interactive guide to epidemiology and statistics.*
- Woodward, M. (2004). *Epidemiology: study design and data analysis*. Chapman & Hall/CRC, second edition.
- Peat, J., Barton, B. and Elliott, E. (2008). *Statistics Workbook for Evidence-based Health Care*. BMJ Books.
- Doi, Suhail (2012). *Understanding Evidence in Health Care: using clinical epidemiology*. Palgrave MacMillan.

SPSS has also been known as PASW and IBM SPSS, so any of these names may appear in book titles. At the time of writing, the version of SPSS used in the USC computer labs is Version 19, and the most current SPSS version in Version 20. By the time this course runs, the versions may differ. All recent versions of SPSS (say, version 17 and upwards) are all very similar:

- Allen, P. A., Bennett, K. (2012). SPSS *statistics: A Practical Guide: Version 20*. Cengage.
- Coakes, S. J. and Ong, C. (2011). *SPSS: Analysis without Anguish: Version 18.0 for Windows*. Wiley.
- Hills, A. (2011). *Foolproof guide to statistics using IBM SPSS* (second edition). Pearson.
- Kirkpatrick, L. A. and Feeney, B. C. (2012). *A Simple Guide to IBM SPSS Statistics for Versions 18.0 and 19.0*. Wadsworth Cengage Learning.

8.3 Specific requirements

You need access to a basic calculator.
You need access to IBM SPSS. If you do not have access to SPSS elsewhere (for example, at your workplace), you will need to purchase SPSS. Unfortunately, student editions of SPSS are no longer available, and the USC licensing arrangements do not allow SPSS to be loaded onto student computers. However, you can access the software online through anywhere.usc.edu.au. You may be able to purchase SPSS from the USC Co-op bookshop. You may also wish to explore purchasing an SPSS license from (for example) www.onthehub.com. (At the time of writing, a six-month licence for IBM SPSS Statistics Base GradPack is about $60.)

9. Risk management

Health and safety risks for this course have been assessed as low.

It is your responsibility as a student to review course material, search online, discuss with lecturers and peers, and understand the health and safety risks associated with your specific course of study. It is also your responsibility to familiarise yourself with the University's general health and safety principles by reviewing the online Health Safety and Wellbeing training module for students, and following the instructions of the University staff.

10. What administrative information is relevant to this course?

10.1 Assessment: Academic Integrity

Academic integrity is the ethical standard of university participation. It ensures that students graduate as a result of proving they are competent in their discipline. This is integral in maintaining the value of academic qualifications. Each industry has expectations and standards of the skills and knowledge within that discipline and these are reflected in assessment.

Academic integrity means that you do not engage in any activity that is considered to be academic fraud; including plagiarism, collusion or outsourcing any part of any assessment item to any other person. You are expected to be honest and ethical by completing all work yourself and indicating in your work which ideas and information were developed by you and which were taken from others. You cannot provide your assessment work to others. You are also expected to provide evidence of wide and critical reading, usually by using appropriate academic references.

In order to minimise incidents of academic fraud, this course may require that some of its assessment tasks, when submitted to Blackboard, are electronically checked through SafeAssign. This software allows for text comparisons to be made between your submitted assessment item and all other work that SafeAssign has access to.

10.2 Assessment: Additional requirements

Eligibility for Supplementary Assessment

Your eligibility for supplementary assessment in a course is dependent of the following conditions applying:

a) The final mark is in the percentage range 47% to 49.4%
b) The course is graded using the Standard Grading scale
c) You have not failed an assessment task in the course due to academic misconduct

10.3 Assessment: Submission penalties

Late submission of assessment tasks will be penalised at the following maximum rate:

- 5% (of the assessment task's identified value) per day for the first two days from the date identified as the due date for the assessment task.
- 10% (of the assessment task's identified value) for the third day
- 20% (of the assessment task's identified value) for the fourth day and subsequent days up to and including seven days from the date identified as the due date for the assessment task.
- A result of zero is awarded for an assessment task submitted after seven days from the date identified as the due date for the assessment task.

Weekdays and weekends are included in the calculation of days late.
To request an extension, you must contact your Course Coordinator and supply the required documentation to negotiate an outcome.

10.4 Study help

In the first instance, you should contact your tutor, then the Course Coordinator. Additional assistance is provided to all students through Academic Skills Advisers. To book an appointment or find a drop-in session go to Student Hub.

Contact Student Central for further assistance: +61 7 5430 2890 or studentcentral@usc.edu.au

10.5 Links to relevant University policy and procedures

For more information on Academic Learning & Teaching categories including:

- Assessment: Courses and Coursework Programs
- Review of Assessment and Final Grades
- Supplementary Assessment
- Administration of Central Examinations
- Deferred Examinations
- Student Academic Misconduct
- Students with a Disability

Visit the USC website:
http://www.usc.edu.au/explore/policies-and-procedures#academic-learning-and-teaching

10.6 General Enquiries

In person:

- **USC Sunshine Coast** - Student Central, Ground Floor, Building C, 90 Sippy Downs Drive, Sippy Downs
- **USC SouthBank** - Student Central, Building A4 (SW1), 52 Merivale Street, South Brisbane
- **USC Gympie** - Student Central, 71 Cartwright Road, Gympie
- **USC Fraser Coast -** Student Central, Student Central, Building A, 161 Old Maryborough Rd, Hervey Bay

Tel: +61 7 5430 2890

Email: studentcentral@usc.edu.au