



Wollongong College Australia

A College of the University of Wollongong

Australia

Wollongong

ITC Education Ltd trading as
Wollongong College Australia
CRICOS 02723D
ABN 14105312329

University Access Program

Subject Outline Summer 2009/10

UAP 004 Mathematics and Statistics

© Wollongong College Australia. All rights reserved 2009.
WCA-UAP 004-S0/6

Mathematics and Statistics

Subject description

This subject provides an introduction to the study of mathematics and statistics as a foundation for further study at university in Arts, Education, Psychology and Commerce courses. Mathematics and Statistics focuses on reinforcing the fundamental concepts of basic mathematics and statistics familiarising students with mathematical and statistical terminology. The subject develops analytical problem solving skills and provides opportunity for students to apply mathematical and statistical methods through problem solving and discussion.

Subject structure

Mathematics and Statistics is a 6 credit point, single session subject consisting of 3 hours of scheduled classes per week. The session is of 14 week's duration with face-to-face classes scheduled for the first 12 weeks and a study/examination period in weeks 13 and 14.

Optional, but highly recommended is a one hour weekly [PASS](#) session. Statistics have shown that students who attend PASS every week have significantly better results than students who choose not to attend. For many students, PASS attendance has proven to be the difference between achieving a pass or a fail.

In addition to scheduled class sessions, students are expected to spend additional time in individual study, revision and homework. As a general guideline students will need to spend at least 1 hour in private study (including completing homework and revision) for every hour of scheduled class time.

Teachers will be available for a consultation time each week. Students will be notified of the time and location of the consultation session during week 1 of session. It is recommended that students experiencing difficulty with this subject arrange to consult with the teacher as difficulties are encountered.

Learning resources

Students will be supplied with lecture notes and exercises to accompany the weekly topics. It is also highly recommended that students with a weak mathematics background purchase a copy of the text:

Thompson, A & Wrightson, E. 2005. *Developmental Mathematics Book 3, 4th Ed.* McGraw Hill, Australia.

A schedule of additional exercises from the above text will be provided on eLearning Space.

Further Reading

Moore, David S, 1997. *Statistics: Concepts and controversies*, W.H. Freeman, New York.

This text can be located at the UOW Library, Short Loans [Ground Floor],

CALL NUMBER 001.422/60

Calculators

Students will be required to bring a scientific calculator to all classes. Students who need to purchase a calculator for this subject are strongly recommended to purchase a Casio FX-82 series (approximately \$25 – \$40) calculator.

Only approved scientific calculators will be permitted in exams. The list of approved calculators is located on the college website (www.wca.uow.edu.au). Students should refer to this list to confirm their calculator has been approved for use in exams. Programmable calculators are not permitted. Programmable calculators usually have a RUN, EXE, CALC or SOLVE button.

Subject outcomes

Successful completion of Mathematics and Statistics will enable students to:

- demonstrate an understanding of mathematical and statistical terminology.
- analyse and solve problems.
- apply mathematical and statistical methods to problem solving.
- demonstrate a working knowledge of basic numeracy skills.
- demonstrate a working knowledge of basic algebra skills.
- solve linear equations.
- draw graphs of linear functions.
- organise raw data into tables and graphs.
- demonstrate a working knowledge of statistical measures of univariate data: measure of centre and variation.
- demonstrate a working knowledge of bivariate data, including linear regression for continuous data and two way tables for categorical data.
- demonstrate understanding of introductory concept of probability.
- demonstrate a working knowledge of statistical measures of the normal distribution.

Participation

Active participation in classes is expected of all students in all classes in the University Access Program. Participation in class discussions will help develop the student's confidence in questioning and commenting on material presented, encourage critical thinking and allow the tutor to evaluate the student's progress.

Participation includes:

- Constructive contribution to general class discussion
- Active participation in tutorial support classes where recommended
- Proactive consultation with class teacher and/or tutorial support where relevant
- Completion of non-assessable tasks including homework and practice tasks
- Recording answers to tutorial exercises in designated tutorial exercise book.
- Preparation for teacher-student consultation sessions
- Active participation in group work

Subject outline in weeks

The following guide to lessons and activities may be adjusted to suit the needs of the group as long as subject outcomes and assessment criteria are met.

Week 1 – Basic Arithmetic

Integers, Fractions

Week 2 – Basic Arithmetic

Decimals, Units & measurement

Conversion between decimals, fractions and percentages

Week 3 - Algebra

Significant figures.

Scientific Notation, Calculations involving scientific notation

Laws of Indices

Introduction to algebra

Week 4 – Quiz & Equations

Quiz 1

Algebra continued (products & factors).

Solving equations.

Week 5 – Equations

Solving equations (cont).

Subject of formulae

Substitution into formulae

Simple and Compound Interest

Linear Equations – introduction, sketching and gradient

Week 6 – Linear Equations

Linear equations -, gradient-intercept form

Applications of Linear Equations

Week 7 - Mid-session exam & Organising Data

Mid-session exam

Organising data - presenting data in tables & graphs

Week 8 – Analysing Data

Reading graphs

Centre – mean, median, mode

Week 9 - Analysing Data

Variability – range, quartiles, IQR, boxplots

Variability – variance, standard deviation

Week 10 - Analysing Data

Bivariate data

Week 11 – Quiz, Probability, Normal Distribution

Quiz 2

Probability – introduction, two-way tables

Introduction to Probability Distributions

Normal Distribution – introduction, standard scores

Week 12 – Normal Distribution & Revision

Normal Distribution – standard normal distribution

Normal Distribution – calculation of probability

Revision for final exam

Weeks 13 & 14 Final examination Period

Examination and study period. Please refer to examination timetable for the exact date, time and location of the final exam.

Assessment

Assessment and plagiarism policy

All written assessment tasks, with the exception of examinations and in-class tasks, must be word-processed unless students are otherwise advised.

Students must keep copies of all assessment tasks submitted for marking with the exception of class tests and examinations.

Plagiarism is a form of cheating or stealing that happens when a student uses someone else's work and presents it as his/her own without showing where it comes from. To avoid this, students are expected to submit their own original work for assessment and to accurately acknowledge all references and sources used in essays and assignments.

For information regarding assessment, plagiarism, acknowledging sources and examination rules, please refer to the Wollongong College Australia Student Handbook <http://www.wca.uow.edu.au/handbook>

Assessment schedule

Task	Due	Weighting	Approx. Length/Time
Quiz 1	Week 4	10%	30 mins
Mid-session exam (Mathematics)	Week 7	40 %	1 hour 15 mins
Quiz 2	Week 11	10%	30 mins
Final examination (Statistics)	Week 13/14	40%	2 hours

Marking Guidelines

WCA best practice is that students can normally expect to have assessment tasks handed back within two weeks, and before the next assessment task is due. On occasion there may be exceptions to this time frame due to, for example, the size of the task, the size of the class, teacher illness or teacher leave.

Where there are several teachers marking a major assessment task, tasks will be handed back by all the teachers within the same week.

Assessment criteria and explanation of components

All assessment components are marked according to set marking criteria.

Quiz 1 **10%**

Quiz 1 covers mathematical topics covered in weeks 1-3.

Calculators are **not** permitted in this quiz.

Mid-session exam (Mathematics) **40%**

This exam covers all topics covered in Weeks 1-6. Students **are** permitted to use a calculator in this examination.

Quiz 2 **10%**

Quiz 2 covers statistical topics covered in weeks 7-10 as well as interpretation of statistical report retrieved from the Australian Bureau of Statistics.

Final examination (Statistics) **40%**

The final exam covers all statistics topics covered in weeks 7-12.

Only non-programmable calculators may be taken into examinations. Students are not permitted to share calculators and other resources while the examination is in progress.