ATHK1001 Analytical Thinking
Unit of Study Outline

Unit of Study Code: ATHK1001

Coordinator: Dr Bruce Burns
Office: Room 512 Griffith Taylor Building
Phone: 9351 8286
E-mail: bruce.burns@sydney.edu.au

Other lecturing staff: Professor Alex Holcombe
Office: Room 504 Griffith Taylor Building
Phone: 9351 2883
E-mail: alex.holcombe@sydney.edu.au

Teaching Fellow: Mr Shir Dekel
Office: 342 Brennan MacCallum Building
E-mail: shir.dekel@sydney.edu.au

Always contact staff using your own University email address.

Credit Point Value: 6 Credit Points

Prerequisites: None

Format of Unit: 3 x 1 hour lectures/week for 13 weeks
1 x 1 hour tutorial/week for 13 weeks

Time Commitment: 4 hours face to face per week; 8 hours private study per week (including up to 1 hour preparation for each tutorial)

NB: This unit is administered by the School of Psychology within the Faculty of Science.
**Lecture attendance:** Required. 80% recommended to pass unit. Audio recordings made of most lecture content and most slides posted online, but technical issues can sometimes prevent material from being recorded.

**Tutorial attendance:** Required. 80% in order to receive a tutorial participation mark (see ASSESSMENT section). You must attend your scheduled tutorial.

**Readings:** There is no required textbook. There is a recommended book for the “Data Concepts” section of the course: Wheelan, C. (2013). Naked Statistics: Stripping the dread from the data. New York: Norton. Other reading resources may be announced during the semester.

**eLearning access:** You are strongly advised to log on to the course’s eLearning site as soon as possible. This contains more information and is also where you will complete and submit assessments. The eLearning portal is: https://canvas.sydney.edu.au/

**ABOUT THIS UNIT**

ATHK1001 provides a general introduction to analytical thinking and how it can be applied to any area of study. ATHK1001 has three broad content areas: data concepts and analysis, logic and critical reasoning, and thinking tools. By the end of the analytical thinking unit you will have a basic conceptual understanding of statistics, though not of its mathematical underpinnings. You will have a basic understanding of how logic can help you think critically, and of the ways people may think more effectively when having to reason, make decisions or learn. These skills should help you in a wide range of courses and could be deepened by taking further units in these areas. This unit is a required unit for the Bachelor of Liberal Arts and Science degree, but is not part of any major or minor sequence.

**LECTURE AND TUTORIAL TIMETABLE**

<table>
<thead>
<tr>
<th>WEEK (begin)</th>
<th>LECTURES</th>
<th>TUTORIALS</th>
<th>Due dates</th>
</tr>
</thead>
</table>
| 1 (5/3)     | 1. What is analytical thinking?  
2. Why study statistics?  
3. Descriptive statistics | Tutorial 1: Orientation | Quiz 1 due by 8/3 |
| 2 (12/3)    | 4. Deceptive statistics  
5. Correlation  
6. Basic probability | Tutorial 2: Using descriptive statistics | Quiz 2 due by 15/3 |
| 3 (19/3)    | 7. Problems with probability  
8. Collecting data  
9. More on data | Tutorial 3: Using correlation | Quiz 3 due by 22/3 |
<table>
<thead>
<tr>
<th>Week</th>
<th>Topics</th>
<th>Tutorials</th>
<th>Assignments Due</th>
</tr>
</thead>
</table>
| 4 (26/3) | 10. The central limit theorem  
 11. Hypothesis testing  
 12. Inference | Tutorial 4: Instructions for Assignment 1 | Quiz 4 due by 29/3 |
| 2/4 | **NON-TEACHING WEEK** | | |
| 5 (9/4) | 13. Categorical data analysis  
 14. Regression analysis  
 15. Regression analysis issues 1 | Tutorial 5: Underpinnings of hypothesis testing | Quiz 5 due by 12/4 |
| 6 (16/4) | 16. Regression analysis issues 2  
 17. Program evaluation  
 18. Summing up | Tutorial 6: Testing hypotheses | Quiz 6 due by 19/4  
 Assignment 1 due 20/4 |
| 7 (23/4)* | 19. Correlation versus causation  
 **ANZAC Day (No Wednesday lecture in Week 7)**  
 20. Mastering correlation versus causation | Tutorial 7: Using statistical tests | Quiz 7 due by 26/4 |
| 8 (30/4) | 21. Correlational study and experiment problems  
 22. Logic and arguments  
 23. The parts of an argument | Tutorial 8: Evidence: Correlations and experiments | Quiz 8 due by 3/5 |
| 9 (7/5) | 24. Fallacies  
 25. Fallacies  
 26. Who to believe and evaluating sources | Tutorial 9: Logic and Syllogisms part 1 | Quiz 9 due 10/5 |
| 10 (14/5) | 27. Who to believe and evaluating sources  
 28. Who to believe and survivorship bias  
 29. Real-life arguments and conversations | Tutorial 10: Logic and Syllogisms part 2 | Quiz 10 due by 17/5 |
| 11 (21/5) | 30. Introduction to *Thinking Skills*  
 31. Reasoning errors  
 32. Better reasoning | Tutorial 11: Reasoning | Quiz 11 due 24/5  
 Assignment 2 due 21/5 |
| 12 (28/5) | 33. Heuristics and biases  
 34. Decision making 1  
 35. Decision making 2 | Tutorial 12: Decision making | Quiz 12 due by 31/5 |
| 13 (4/6) | 36. Improving thinking and learning 1  
 37. Improving thinking and learning 2  
 38. Wrapping up | Tutorial 13: Applications | Quiz 13 due by 7/6 |

Note that lecture and tutorial titles may be subject to change. In the unlikely event that due dates for any assessment change you will be informed in good time by e-mail, postings on the unit’s e-learning site, and in lecture.

*Anzac Day Public Holiday is Wednesday Week 7. Lectures and tutorials are not held on Public Holidays. If you are in an affected tutorial please go to different tutorial during the week. Ask the tutor before the tutorial if you can sit in.

**Location of lectures depends on the day of the week, so refer to your timetable for lecture locations and the location of your tutorial.**
<table>
<thead>
<tr>
<th>Assessment title</th>
<th>Compulsory</th>
<th>Assessment category</th>
<th>Assessment type</th>
<th>Description</th>
<th>Individual / Group</th>
<th>Length / Duration</th>
<th>Weight</th>
<th>Due date and time</th>
<th>Closing date</th>
</tr>
</thead>
<tbody>
<tr>
<td>Assignment 1</td>
<td>Yes**</td>
<td>Submitted work</td>
<td>Assignment</td>
<td>Written assignment on analysis and interpretation of a unique data set</td>
<td>Individual</td>
<td>750 words</td>
<td>15%</td>
<td>11:59pm Friday 20th April</td>
<td>Friday 18th May</td>
</tr>
<tr>
<td>Assignment 2</td>
<td>Yes**</td>
<td>Submitted work</td>
<td>Assignment</td>
<td>Written assignment demonstrating use of tools of logic and critical reasoning</td>
<td>Individual</td>
<td>Up to 1000 words</td>
<td>20%</td>
<td>11:59pm Monday 21st May</td>
<td>Tuesday 12th June</td>
</tr>
<tr>
<td>Mastery Quiz #1</td>
<td>No</td>
<td>In class assessment</td>
<td>Small test</td>
<td>On-line mastery quiz on lecture and tutorial content</td>
<td>Individual</td>
<td>Available for two days from Tuesday 6/3</td>
<td>1%*</td>
<td>Thursday 8/3, 6pm</td>
<td>Thursday 8/3, 6pm</td>
</tr>
<tr>
<td>Mastery Quiz #2</td>
<td>No</td>
<td>In class assessment</td>
<td>Small test</td>
<td>On-line mastery quiz on lecture and tutorial content</td>
<td>Individual</td>
<td>Available for one week from Thursday 8/3</td>
<td>1%*</td>
<td>Thursday 15/3, 6pm</td>
<td>Thursday 15/3, 6pm</td>
</tr>
<tr>
<td>Mastery Quiz #3</td>
<td>No</td>
<td>In class assessment</td>
<td>Small test</td>
<td>On-line mastery quiz on lecture and tutorial content</td>
<td>Individual</td>
<td>Available for one week from Thursday 15/3</td>
<td>1%*</td>
<td>Thursday 22/3, 6pm</td>
<td>Thursday 22/3, 6pm</td>
</tr>
<tr>
<td>Mastery Quiz #4</td>
<td>No</td>
<td>In class assessment</td>
<td>Small test</td>
<td>On-line mastery quiz on lecture and tutorial content</td>
<td>Individual</td>
<td>Available for one week from Thursday 22/3</td>
<td>1%*</td>
<td>Thursday 29/3, 6pm</td>
<td>Thursday 29/3, 6pm</td>
</tr>
<tr>
<td>Mastery Quiz #5</td>
<td>No</td>
<td>In class assessment</td>
<td>Small test</td>
<td>On-line mastery quiz on lecture and tutorial content</td>
<td>Individual</td>
<td>Available for two weeks from Thursday 29/3</td>
<td>1%*</td>
<td>Thursday 12/4, 6pm</td>
<td>Thursday 12/4, 6pm</td>
</tr>
<tr>
<td>Mastery Quiz #6</td>
<td>No</td>
<td>In class assessment</td>
<td>Small test</td>
<td>On-line mastery quiz on lecture and tutorial content</td>
<td>Individual</td>
<td>Available for one week from Thursday 12/4</td>
<td>1%*</td>
<td>Thursday 19/4, 6pm</td>
<td>Thursday 19/4, 6pm</td>
</tr>
<tr>
<td>Mastery Quiz #7</td>
<td>No</td>
<td>In class assessment</td>
<td>Small test</td>
<td>On-line mastery quiz on lecture and tutorial content</td>
<td>Individual</td>
<td>Available for one week from Thursday 19/4</td>
<td>1%*</td>
<td>Thursday 26/4, 6pm</td>
<td>Thursday 26/4, 6pm</td>
</tr>
<tr>
<td>Mastery Quiz #8</td>
<td>No</td>
<td>In class assessment</td>
<td>Small test</td>
<td>On-line mastery quiz on lecture and tutorial content</td>
<td>Individual</td>
<td>Available for one week from Thursday 26/4</td>
<td>1%*</td>
<td>Thursday 3/5, 6pm</td>
<td>Thursday 3/5, 6pm</td>
</tr>
<tr>
<td>Mastery Quiz #9</td>
<td>No</td>
<td>In class assessment</td>
<td>Small test</td>
<td>On-line mastery quiz on lecture and tutorial content</td>
<td>Individual</td>
<td>Available for one week from Thursday 3/5</td>
<td>1%*</td>
<td>Thursday 10/5, 6pm</td>
<td>Thursday 10/5, 6pm</td>
</tr>
<tr>
<td>Mastery Quiz #10</td>
<td>No</td>
<td>In class assessment</td>
<td>Small test</td>
<td>On-line mastery quiz on lecture and tutorial content</td>
<td>Individual</td>
<td>Available for one week from Thursday 10/5</td>
<td>1%*</td>
<td>Thursday 17/5, 6pm</td>
<td>Thursday 17/5, 6pm</td>
</tr>
<tr>
<td>Mastery Quiz #11</td>
<td>No</td>
<td>In class assessment</td>
<td>Small test</td>
<td>On-line mastery quiz on lecture and tutorial content</td>
<td>Individual</td>
<td>Available for one week from Thursday 17/5</td>
<td>1%*</td>
<td>Thursday 24/5, 6pm</td>
<td>Thursday 24/5, 6pm</td>
</tr>
<tr>
<td>Mastery Quiz #12</td>
<td>No</td>
<td>In class assessment</td>
<td>Small test</td>
<td>On-line mastery quiz on lecture and tutorial content</td>
<td>Individual</td>
<td>Available for one week from Thursday 24/5</td>
<td>1%*</td>
<td>Thursday 31/5, 6pm</td>
<td>Thursday 31/5, 6pm</td>
</tr>
</tbody>
</table>

ATHK1001 Assessment Summary
* Only your 10 best quiz marks out of the 13 quizzes count towards your final mark.

** Completion of compulsory assessments is necessary to pass this unit. Students who fail to complete any of these components will receive an “Absent Fail” grade, regardless of their marks in other assessments. To fulfill this requirement a serious attempt must be made.

³ “in class” is the category label we have to use here, but this assessment can be done online at anytime up until the due date.

<table>
<thead>
<tr>
<th>Assessment</th>
<th>Type</th>
<th>In class³</th>
<th>Small test</th>
<th>On-line mastery quiz on lecture and tutorial content</th>
<th>Individual</th>
<th>Available for one week from Thursday 31/5</th>
<th>%</th>
<th>Thursday 7/6, 6pm</th>
<th>Thursday 7/6, 6pm</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mastery Quiz #13</td>
<td>No</td>
<td>No</td>
<td></td>
<td></td>
<td>Individual</td>
<td></td>
<td>1%*</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Tutorial Participation</td>
<td>No</td>
<td></td>
<td>Attendance</td>
<td>Attendance and participation in tutorials</td>
<td>Individual</td>
<td>Collected over all 13 tutorials</td>
<td>5%</td>
<td>Weekly</td>
<td>N/A</td>
</tr>
<tr>
<td>ATHK1001 Final Exam</td>
<td>Yes**</td>
<td>Exam</td>
<td>Final Exam</td>
<td>Major ATHK1001 Exam</td>
<td>Individual</td>
<td>120 minutes, 80 multiple choice</td>
<td>50%</td>
<td>N/A</td>
<td>N/A</td>
</tr>
</tbody>
</table>

| Total                      |      |           |            |                                                     |            |                                           | 100%|                  |                    |
ATHK1001 Replacement Assessment Assessment Summary

<table>
<thead>
<tr>
<th>Assessment title</th>
<th>Assessment category</th>
<th>Assessment type</th>
<th>Description</th>
<th>Individual / Group</th>
<th>Length / Duration</th>
<th>Weight</th>
<th>Due date and time</th>
<th>Closing date</th>
</tr>
</thead>
<tbody>
<tr>
<td>Replacement Assignment 1</td>
<td>Submitted work</td>
<td>Assignment</td>
<td>Makeup Assignment 1 on analysis and interpretation of a unique data set to allow for a serious attempt (no marks)</td>
<td>Individual</td>
<td>750 words</td>
<td>0%*</td>
<td>11:59pm Monday 2nd July*</td>
<td>11:59pm Monday 2nd July*</td>
</tr>
<tr>
<td>Replacement Assignment 2</td>
<td>Submitted work</td>
<td>Assignment</td>
<td>Makeup Assignment 2 demonstrating use of tools of logic and critical reasoning to allow for a serious attempt (no marks)</td>
<td>Individual</td>
<td>Up to 1000 words</td>
<td>0%*</td>
<td>11:59pm Monday 2nd July*</td>
<td>11:59pm Monday 2nd July*</td>
</tr>
<tr>
<td>ReplacementATHK1001 Final Exam</td>
<td>Exam</td>
<td>Final Exam</td>
<td>Major ATHK1001 Exam</td>
<td>Individual</td>
<td>120 minutes, mixture of multiple choice and short-answer questions</td>
<td>50%</td>
<td>Will be scheduled during the replacement exam period</td>
<td></td>
</tr>
</tbody>
</table>

- If you have special consideration that extends beyond the closing date of the original assignment then you may be given an alternative assignment instead. In this case it will have the same weighting as the original assignment (not 0%) and a due data which is the end date of your special consideration.

Disruptions to your study (Special consideration)

If your assessments are disrupted by illness or misadventure or unavoidable community commitments, apply for Special Consideration or Special Arrangements online here: [http://sydney.edu.au/current_students/special_consideration/index.shtml](http://sydney.edu.au/current_students/special_consideration/index.shtml)

If you have (or develop) a continuing issue, register with Disability Services here: [www.sydney.edu.au/disability](http://www.sydney.edu.au/disability)

Types of disabilities include (but are not limited to): Anxiety, Arthritis, Asthma, Autism, ADHD, Bipolar disorder, Broken bones, Cancer, Cerebral palsy, Chronic fatigue syndrome, Crohn’s disease, Cystic fibrosis, Depression Diabetes, Dyslexia, Epilepsy, Hearing impairment, Learning disability, Mobility impairment, Multiple sclerosis, Post-traumatic stress, Schizophrenia, Vision impairment.

In this unit of study Simple Extensions are not granted. Apply formally for special consideration or via Disability services if you require any extension.
You may apply for special consideration when your tutorial attendance is affected, however special consideration will not be granted for missed quizzes unless you are affected for more than three weeks, because you only have to count 10 out of 13 quizzes.

**Assessment standards and criteria**

**Assignment 1**
Assignment 1 is a compulsory assignment which means that a serious attempt must be submitted before the closing date. A serious attempt must:

- Be within 30% of the 750-word limit (excluding references)
- Have identifiable sections addressing questions representing at least 70% of the available marks
- Be written wholly by you for the assignment

**Assignment 2**
Assignment 2 is a compulsory assignment which means that a serious attempt must be submitted before the closing date. A serious attempt must:

- Have identifiable sections addressing questions representing at least 70% of the available marks
- Be written wholly by you for the assignment

**Late penalties**
For Assignments 1 and 2 you will receive a penalty of 5% of the maximum value of the assignment each calendar day or part thereof it is submitted after your due date. After 20 calendar days past your due date, a mark of zero is applied. Submissions will not be accepted after the closing date of the assignment.

<table>
<thead>
<tr>
<th>Example submission time</th>
<th>Penalty Applied</th>
</tr>
</thead>
<tbody>
<tr>
<td>1203am the day after due date (4 minutes late)</td>
<td>-5%</td>
</tr>
<tr>
<td>3 days and 4 seconds after due date</td>
<td>-20%</td>
</tr>
<tr>
<td>10 days after due date</td>
<td>-50%</td>
</tr>
<tr>
<td>20 days and 7 seconds after due date</td>
<td>-100%</td>
</tr>
<tr>
<td>&gt;20 days the due date but before closing date</td>
<td>-100% but accepted (if a serious attempt)</td>
</tr>
<tr>
<td>After closing date</td>
<td>-100% AND not accepted (replacement assignment required to avoid AF)</td>
</tr>
</tbody>
</table>

If you do not submit a serious attempt at either Assignment 1 or Assignment 2 before the closing date, you must attempt the relevant replacement assignment. This is an entirely new assignment. It is not awarded marks, but if you submit a serious attempt you avoid an absent fail.

**Incorrect submission penalty**
If you discover before the closing date that the file you submitted on Turnitin was incorrect, and let us know, you may be given the option to resubmit a corrected version which will incur a 50% mark (~50%) penalty or the relevant lateness penalty, whichever is greater. If you do not discover this before the closing date and/or do not let us know, your submission will be considered for what it was.
Mastery Quizzes (1 through 13)

**Contribution to final mark:** 10% of your total mark. There are 13 quizzes each potentially worth 1% of your final mark, but we count only your ten best quiz marks.

**Due Date:** Every week at 6:01pm Thursday an on-line mastery quiz will be posted on the ATHK1001 eLearning website. Each quiz will consist of a small number of questions about the material presented that week in lectures or tutorials. The week’s quiz will be due at 6pm the following Thursday, so essentially a quiz will be online constantly during the semester, but it will change at 6pm every Thursday. Until it is due, a quiz can be done as many times as you like, and it will give you immediate feedback regarding your score, so you could do it over and over again until you have all the answers correct. The primary goal of these quizzes is to encourage you to engage continuously with the course material. Note that special consideration is not given for quizzes unless you are affected for more than three weeks because you can miss up to three quizzes with no effect on your mark.

Tutorial participation

**Contribution to final mark:** 5% of your total mark. You must attend 80% or more of your tutorial classes to obtain any part of this 5%. If you fail to attend at least 80% you will receive 0 marks for this element of the assessment.

**Assessment:** YOU MUST ATTEND THE TUTORIAL YOU ARE ENROLLED IN TO BE MARKED AS PRESENT. Your final mark is not just assessed on attendance but also your level of participation in tutorials as judged by your tutor.

**Checking records:** Tutorial attendance records will be made available the week following a tutorial via the ATHK1001 eLearning website. You will be informed by e-mail that the attendance records for the previous week have been posted. You then have two weeks in which to request a correction if there has been a mistake. Final participation marks are released to students at the end of Semester.

Final Examination

**Format:** Multiple choice questions for Data Concepts and Analysis (45% weighting), Logic and Critical Reasoning (30% weighting), and Thinking Tools (25% weighting) sections. The final exam will consist of 80 multiple choice items but a replacement exam may vary in format to the original exam and be a mixture of multiple choice and short-answer questions.

**Attendance:** The initial final exam is a compulsory assessment, but so long as you attend no minimum performance is required. A successful application for Special Consideration or Special Arrangements for the final exam will result in you being offered a replacement exam during the replacement exam period. Final exams are never offered earlier than the scheduled time.

In this unit no minimum mark for any assessment automatically results in a fail. If your weighted marks for all assessment tasks add up to 50% or more, you will pass the unit, as long as all compulsory components are completed.

Academic Honesty

While the University is aware that the vast majority of students and staff act ethically and honestly, it is opposed to and will not tolerate academic dishonesty or plagiarism and will treat all allegations of dishonesty seriously.
All students are expected to be familiar and act in compliance with the relevant University policies, procedures and codes, which include:

- Academic Honesty in Coursework Policy 2015
- Academic Honesty Procedures 2016
- Code of Conduct for Students
- Research Code of Conduct 2013 (for honours and postgraduate dissertation units)

They can be accessed via the University’s Policy Register: http://sydney.edu.au/policies (enter “Academic Honesty” in the search field).

Students should never use document-sharing sites and should be extremely wary of using online “tutor” services. Further information on academic honesty and the resources available to all students can be found on the Academic Integrity page of the University website: http://sydney.edu.au/elearning/student/EI/index.shtml

**Academic Dishonesty and Plagiarism**

*Academic dishonesty involves seeking unfair academic advantage or helping another student to do so.*

You may be found to have engaged in academic dishonesty if you:

- Resubmit (or “recycle”) work that you have already submitted for assessment in the same unit or in a different unit or previous attempt;
- Use assignment answers hosted on the internet, including those uploaded to document sharing websites by other students.
- Have someone else complete part or all of an assignment for you, or do this for another student.
- Except for legitimate group work purposes, providing assignment questions and answers to other students directly or through social media platforms or document (“notes”) sharing websites, including essays and written reports.
- Engage in examination misconduct, including using cheat notes or unapproved electronic devices (e.g., smartphones), copying from other students, discussing an exam with another person while it is in progress, or removing confidential examination papers from the examination venue.
- Engage in dishonest plagiarism.

**Plagiarism means presenting another person’s work as if it is your own without properly or adequately referencing the original source of the work.**

Plagiarism is using someone else’s ideas, words, formulas, methods, evidence, programming code, images, artworks, or musical creations without proper acknowledgement. If you use someone’s actual words you must use quotation marks as well as an appropriate reference. If you use someone’s ideas, formulas, methods, evidence, tables or images you must use a reference. You must not present someone’s artistic work, musical creation, programming code or any other form of intellectual property as your own. If referring to any of these, you must always present them as the work of their creator and reference in an appropriate way.

Plagiarism is always unacceptable, regardless of whether it is done intentionally or not. It is considered dishonest if done knowingly, with intent to deceive or if a reasonable person can see that the assignment contains more work copied from other sources than the student’s original work. The University understands that not all plagiarism is dishonest and provides students with opportunities to improve their academic writing, including their understanding of scholarly citation and referencing practices.
Use of similarity detection software

All written assignments submitted in this unit of study will be submitted to the similarity detecting software program known as Turnitin. Turnitin searches for matches between text in your written assessment task and text sourced from the Internet, published works and assignments that have previously been submitted to Turnitin for analysis.

There will always be some degree of text-matching when using Turnitin. Text-matching may occur in use of direct quotations, technical terms and phrases, or the listing of bibliographic material. This does not mean you will automatically be accused of academic dishonesty or plagiarism, although Turnitin reports may be used as evidence in academic dishonesty and plagiarism decision-making processes.

All students commencing their study at the University of Sydney are required to complete the Academic Honesty Education Module (AHEM) which is accessible via your eLearning site.

ATHK1001 SYLLABUS

Unit of study general description:
Analytical Thinking is a course covering aspects of reasoning, logic, data handling, research design, interpretation of data analysis, and understanding of relationships between variables. It is comprised of three sections: Data Concepts and Analysis, Logic and Critical Reasoning, and Thinking Tools. The section on data concepts and analysis covers aspects of research design, data collection, literature review and basic forms of hypothesis testing are statistical tests are introduced. The logic and critical reasoning section covers material ranging from valid and invalid forms of argument and errors in reasoning to critiques of arguments presented in case studies. The thinking tools section looks at the errors people make in reasoning, decision making and problem solving and how to avoid these errors. Together, the three course components teach foundational skills necessary for carrying out meaningful academic discussions, arguments, and research studies, which may be applied to any content area of enquiry.

Data Concepts and Analysis (Lectures Week 1-6)

Conveying information through data
Introduction to ways of describing data such as descriptive statistics, correlation and distributions. Understanding the assumptions and limitations of such descriptions and how to ask the right questions about data so as to be able to assess its usefulness.

Answering questions with data
How we use data to answer questions. Based on an understanding of probability we build up the conceptual basis of hypothesis testing and statistical inference (including t-tests and basic regression analysis). The emphasis is on understanding the results of such analysis rather than the calculations required. From such a conceptual understanding you should be able to critique the use and misuse of these analyses based on aspects such as their research design or data collection methods.
Logic and Critical Reasoning (Lectures Week 7-10)

Elements of argument
Introduction to the structure of arguments and explanations. The role of meaning and definition in argument.

Deduction and induction
Two kinds of arguments and their role in science and everyday reasoning.

Formal and informal fallacies
Spotting and remedying flaws in arguments.

Evaluating sources
Who or what should you trust?

Real-life arguments and conversations
Moving from obstinacy to cooperative learning

Thinking Tools (Lectures Week 11-13)

Reasoning, decision making and problem solving
Introduction to what research into thinking tells us about errors people make, and thus how we may better reason and make decisions.

Effective learning
Applying what we know about memory and skill acquisition to formulate principles for how people learn most effectively.

Objectives

When planning and prioritizing your study aim to:

1. Understand the key details for the content of each lecture topic – take good lecture notes and revise as you go. The mastery quizzes will help you do this. Try to understand the key content because it will be assessed in the assignments and FINAL EXAM.
2. If you are having difficulty understanding the material ask questions of your tutor or lecturer, or consult the recommended readings for another perspective on the material.
3. Attend tutorials so you can interact with your peers and tutor to develop your understanding of lecture concepts. In tutorials you will be using the tools and concepts presented in lectures. Using these tools is the most effective way to build your understanding of them. You will also receive assistance for your assignments. Some tutorial content will be assessed in the mastery quizzes and where it overlaps with lecture content it will also be assessed in the FINAL EXAM.
4. The assignments will be your opportunity to demonstrate your understanding of some of the tools presented in lectures. The content of the assessment changes each year, and it also allow you to demonstrate your writing skills.

Learning outcomes (and Graduate qualities)

1. A basic conceptual understanding of statistics, though not of its mathematical underpinnings. A basic understanding of how logic can help you think critically, and of the ways people may think more effectively when having to reason, make decisions or learn. These skills should help you in a wide range of courses and could be deepened by taking further units in these areas. (Depth of disciplinary expertise)

2. Be able to identify and analyse problems, and be both creative and principled thinkers within their discipline. Analytical thinking will contribute to this by helping you:
   (i) Demonstrate the ability to critique the arguments of others.
   (ii) Exercise logic and reasoning in the formation of arguments.
   (iii) Understand and evaluate the quality of data based on its sources and the manner in which it was obtained.
   (iv) Identify ways of approaching the exploration of a research question.
   (v) Identify errors in thinking and how to avoid them.
   (Broader skills)

3. Be able to use information effectively in a range of contexts. Analytical Thinking will contribute to this by helping you:
   (i) Demonstrate an understanding of different types of research and the ways in which they can be used.
   (ii) Demonstrate the ability to identify premises of arguments and evaluate these.
   (iii) Understand potential sources of bias in information.
   (iv) Understand the limitations of a source of information and the implications of this
   (Broader skills)

4. In ATHK1001 you will interact with students from many backgrounds and cultural groups, so you are sure to meet and be challenged by a diverse array of personalities and perspectives. Examples used to illustrate analytical thinking will come from a variety of disciplines and cultures. (Cultural Competence)

5. Analytical thinking is not specific to a particular discipline; its tools are designed to be cross-disciplinary. Although the background of the teaching staff is psychology, we strive to choose examples for applying these tools from many domains. (Interdisciplinary effectiveness)

6. Be able to work independently and sustain an attitude of openness and capacity to meet new challenges. Analytical Thinking will contribute to this by helping you:
(i) Demonstrate an active participation in debate and discussion.
(ii) Demonstrate the ability to work independently.
(iii) Show a willingness to engage with and respond to unfamiliar problems.
(iv) Demonstrate the ability to regulate learning independently by using course resources appropriately.
(v) Demonstrate the ability to autonomously direct inquiry for the purpose of answering empirical questions.

(An integrated professional, ethical and personal identity)

7. Graduates of the University will hold personal values and beliefs consistent with their role as responsible members of local, national, international and professional communities. Analytical Thinking will contribute to this by helping you:
(i) Recognise the ethical requirements of academic research and discourse.
(ii) Respect and support the practice of sound data collection and analysis.
(iii) Respect and uphold the value of diversity in opinions and beliefs.
(iv) Uphold the value of honesty, transparency, and rigour in all academic pursuits.

(An integrated professional, ethical and personal identity)

8. An understanding of analytical thinking will help you become more effective at exercising your professional skills. By helping you evaluate the claims and data that people use you can better contribute to society. (Influence)

Contesting Marks

Students do not have an automatic right to request re-marking of class work or exam papers, but they are encouraged to discuss the assessment of their work with members of the teaching staff. Before doing so, students must make sure they have read and understood any written comments already supplied by the marker. The following remarking/appeal process should be initiated within two weeks of marks being returned.

Students who are dissatisfied with some aspect of their assessment should:

- First consult the marker (usually their tutor), who will provide feedback for the given mark. If the tutor was not the marker of the assessment and cannot supply sufficient feedback, the Unit co-ordinator of the relevant Unit will direct them to the staff member responsible for the assessment.
- If the student is not satisfied, they should provide a written case explaining why they believe the work should be re-marked and approach the Unit co-ordinator with this written case. This must be done within three weeks of receiving your marked assignment. The Unit co-ordinator may agree and allow the work to be re-marked. Note: The new mark may be lower than the original mark, in which case the new mark will stand.
- If the Unit co-ordinator does not believe the work should be re-marked, or if after re-marking, the student still believes that the work has been improperly assessed, s/he should address such concerns in writing to the Associate Head Education in the School of Psychology. Letters to the Associate Head Education should be emailed directly.
Normally, the Associate Head Education will consider re-marking of submissions only if both the following are true:

- The student has discussed the reasons for their mark with the staff member(s) responsible for the assessment.
- The student clearly establishes, in writing, reasons for receiving a mark higher than that awarded, taking into account the feedback they have received from the previous marker(s).

Please note that the new mark may be lower than the original mark, in which case the new mark will stand.

**Student Code of Conduct**

Students at the University of Sydney are bound by a Code of Conduct, which can be found here: http://sydney.edu.au/policies/showdoc.aspx?recnum=PDOC2011/215&RendNum=0

**University Email**

Check your University email on a regular basis, or forward your University email to an address you do check regularly. All electronic University communication will be sent to your University email address. Always use your University email when contacting staff in this course. Find a login for your email, eLearning site, Sydney Student (Enrolment) and Timetable and much more here: https://sydney.edu.au/students/

**Data collection**

Note that your participation in this unit of study permits us to use your learning analytics to improve your experience of learning.