Description: Multivariate Statistics B

<table>
<thead>
<tr>
<th>Subject</th>
<th>Cat-Nbr</th>
<th>Class</th>
<th>Term</th>
<th>Mode</th>
<th>Units</th>
<th>Campus</th>
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<tr>
<td>PSY</td>
<td>4011</td>
<td>24534</td>
<td>2, 2003</td>
<td>ONC</td>
<td>0.50</td>
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Academic Group: FOSCI
Academic Org: FOS005
HECS Band: 1
ASCED Code: 090701

STAFFING
Examiner: Ken Mavor
Moderator: Eric Marx

PRE-REQUISITES
Pre-requisite: PSY4010

OTHER-REQUISITES
"Only available to students enrolled in the BSc (Hons) in Psychology major".

RATIONALE
Psychology is a data-based discipline, and 4th year students in psychology need to master a variety of advanced statistical techniques as part of their training. The multivariate General Linear Model includes many of the most commonly used techniques. This course encourages students to develop both a practical and theoretical understanding of advanced multivariate statistical techniques that allows them to evaluate existing research and apply these insights to their own research. This course extends upon earlier statistics and research methods courses, and forms a major foundation for student research at Masters and PhD level, and for the data analytic aspects of professional elective courses.

SYNOPSIS
This course extends on the techniques covered in PSY4010 Multivariate Statistics A and assumes mastery of that material. Topics covered at a formal level include Matrix Algebra, Path Analysis, and Factor Analysis. Students will also be required to carry out analyses using these techniques, particularly the several varieties of factor analysis. Students are required to demonstrate their formal understanding and practical competence in assignments and an exam.
OBJECTIVES

On successful completion of this course students will be able to:

- recognise and use the basic rules of matrix algebra;
- use the SPSS matrix language to carry out matrix computations;
- state and use the rules for path tracing;
- explain the differences between direct, indirect, spurious and unanalysed paths;
- explain the role of latent variables in path models;
- discuss the role of exploratory factor analysis;
- carry out factor analyses using a variety of factoring techniques and rotations;
- interpret the output of SPSS factor analysis;
- discuss the use of factor techniques and reliability analysis in the development of measurement scales;
- assess the dimensionality and reliability of measurement scales.

TOPICS

<table>
<thead>
<tr>
<th>Description</th>
<th>Weighting (%)</th>
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<tbody>
<tr>
<td>1. Introduction to Matrix Algebra - basic operations - rules of matrix algebra - basic statistical applications - advanced applications</td>
<td>20.00</td>
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<tr>
<td>2. Path Analysis - path tracing rules - modelling correlations - direct, indirect, spurious, and unanalysed effects</td>
<td>30.00</td>
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<tr>
<td>3. Factor Analysis - understanding the model - basic applications - factorability of a matrix - factor rotation</td>
<td>30.00</td>
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<tr>
<td>4. Measurement Scales - assessing dimensionality - assessing reliability</td>
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TEXT and MATERIALS required to be PURCHASED or ACCESSED:

Books can be ordered by fax or telephone. For costs and further details use the 'Book Search' facility at http://bookshop.usq.edu.au by entering the author or title of the text.

SPSS Graduate pack or Licence


Introductory Book 2003, *PSY4011 Multivariate Statistics B*, USQ Distance Education Centre, Toowoomba.

Selected Readings 2003, *PSY4011 Multivariate Statistics B*, USQ Distance Education Centre, Toowoomba.

Study Book 2003, *PSY4011 Multivariate Statistics B*, USQ Distance Education Centre, Toowoomba.

## STUDENT WORKLOAD REQUIREMENTS

<table>
<thead>
<tr>
<th>ACTIVITY</th>
<th>HOURS</th>
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<tbody>
<tr>
<td>Assessment</td>
<td>20</td>
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<tr>
<td>Directed Study</td>
<td>15</td>
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<tr>
<td>Examinations</td>
<td>6</td>
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<td>Laboratory or Practical Classes</td>
<td>8</td>
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<td>Lectures</td>
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<tr>
<td>Private Study</td>
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<td>Tutorial</td>
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## ASSESSMENT DETAILS

<table>
<thead>
<tr>
<th>Description</th>
<th>Marks Out of</th>
<th>Wtg(%)</th>
<th>Required</th>
<th>Due Date</th>
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<tr>
<td>ASSIGNMENT 1</td>
<td>100.00</td>
<td>20.00</td>
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<td>12 Sep 2003</td>
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<td>ASSIGNMENT 2</td>
<td>100.00</td>
<td>40.00</td>
<td>Y</td>
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<tr>
<td>3HR PTA REST EX (MULT CHOICE)</td>
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<td>22 Jul 2003</td>
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<tr>
<td>3HR PTB REST EX (COMP &amp; ESSAY)</td>
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<td>25.00</td>
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**NOTES:**

- Examination dates will be available during the Semester. Please refer to the examination timetable when published.
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## IMPORTANT ASSESSMENT INFORMATION

1. **Attendance requirements:**
   - It is the students' responsibility to attend and participate appropriately in all activities (such as lectures, tutorials, laboratories and practical work) scheduled for them, and to study all material provided to them or required to be accessed by them to maximise their chance of meeting the objectives of the course and to be informed of course-related activities and administration.

2. **Requirements for students to complete each assessment item satisfactorily:**
   - To complete assessment items satisfactorily, students must: gain at least 40% in each assignment, 60% in the assignments overall, 50% in the multiple choice section of the examination, 40% in the computation/essay section of the examination.

3. **Penalties for late submission of required work:**
Students may submit individual assignment work up to 2 weeks beyond the due date without prior notice. However, individual assignments submitted after the due date may not be returned in time to assist in the following assessment. Individual assignments submitted more than 2 weeks after the due date will not be assigned a mark as solutions may already have been distributed.

4 Requirements for student to be awarded a passing grade in the course:
To be certain of a passing grade in this course, students must satisfactorily complete their assessment items and gain 60% in the course assessment overall.

5 Method used to combine assessment results to attain final grade:
The final grades for students will be assigned on the basis of the weighted aggregate of the marks (or grades) obtained for each of the summative assessment items in the course.

6 Examination information:
Restricted Examination: Candidates will be allowed access only to specific materials in a restricted examination. The only materials that candidates may use in the restricted examination for this course are: (a) writing materials (non-electronic and free from material which could give the student an unfair advantage in the examination); (b) calculators which cannot hold textual information (students must indicate on their examination paper the make and model of any calculator(s) they use during the examination). With the approval of the examiner, candidates may take an appropriate non-electronic translation dictionary into the examination. This will be subject to perusal and may be removed from the candidate's possession until appropriate disciplinary action is completed if found to contain material that could give the candidate an unfair advantage.

7 Examination period when Deferred/Supplementary examinations will be held:
Any supplementary or deferred examinations for this course will be held during the examination period at the end of the semester of the next offering of this course.

8 University Regulations:
Students should read USQ Regulations 5.1 Definitions, 5.6. Assessment, and 5.10 Academic Misconduct for further information and to avoid actions which might contravene University Regulations. These regulations can be found at the URL http://www.usq.edu.au/SECARIAT/calendar/Part5/ or in the printed version of the current USQ Handbook.

ASSESSMENT NOTES

9 The due date for an assignment is the date by which a student must despatch the assignment to the USQ. The onus is on the student to provide proof of the despatch date, if requested by the Examiner.

10 Students must retain a copy of each item submitted for assessment. This must be produced within 48 hours if required by the Examiner.

11 The examiner may grant an extension of the due date of an assignment in extenuating circumstances.

12 Students who obtain an overall passing mark, but who do not perform satisfactorily in an examination, may, at the discretion of the examiner, be granted a supplementary examination. Students will be granted a deferred examination only if they perform satisfactorily in all other assessment items.