Transition from School to Tertiary Mathematics University Survey

This questionnaire is part of an ICME survey to investigate mathematical issues in student transition from school to tertiary mathematics study. Your assistance in taking some of your valuable time to fill it in is much appreciated and we thank you in advance for doing so. The results will be presented at the 2012 ICME conference in Seoul.

Please complete this pdf form electronically, filling in as many of the questions and replies as you can, clicking on the answer boxes or typing into the spaces provided. Feel free to type additional information or comments you may think are appropriate in the final box. The boxes allow for multiple line entry beyond the space shown.

When complete please return by email before November 30th to:

Prof Mike Thomas
moj.thomas@auckland.ac.nz

Please feel free to email if you have any questions or comments.

1—Your Details

Q1 Are you Male ❍ Female ❍?

Q2 What is your age group? 21-30 ❍ 31-40 ❍ 41-50 ❍ 51-60 ❍ 61- ❍

Q3 How many years have you been teaching university mathematics? _____ years

Q4 Your Department _____

Your University _____ Country _____

Q5 Your position

Tutor/Senior Tutor ◯ Lecturer ◯ Senior Lecturer ◯ Assistant Professor ◯ Associate Professor ◯ Reader ◯ Full Professor ◯

Q6 Total number of Year 1 students studying mathematics in all departments at your university

<50 ◯ <100 ◯ <200 ◯ <300 ◯ <500 ◯ <700 ◯ <900 ◯ <1100 ◯ <1300 ◯ <1500 ◯ >1500 ◯

Number of students majoring in mathematics at your university in Year 3 (excluding teacher training)

<50 ◯ <100 ◯ <200 ◯ <300 ◯ <500 ◯ <700 ◯ <900 ◯ <1100 ◯ >1100 ◯

2—Your Mathematics Department

Q1 Does your department periodically change the typical content of your first year programme?

Yes ❍ No ❍

If 'Yes' (if 'No' go to question 2)
(i) How does your department decide on appropriate content for the first year mathematics programme for students?

(ii) How has the content of your first year mathematics courses changed in the last 5 years?

Q2 Do you have any academic support structures to assist students in the transition from school to university? (e.g., workshops, bridging courses, mentoring, etc)

Yes ❍ No ❍

If yes, describe them.

Q3 Please tick any of the following that are taught in **first** year mathematics at your university (you do not need a course with these names).

Pre-Calculus ❑ Calculus ❑ Linear algebra ❑ Real analysis ❑ Complex analysis ❑

Geometry ❑ Discrete Mathematics ❑ Topology ❑ Number theory ❑ Graph theory ❑

Differential equations ❑ Set theory ❑ Proof ❑ Modelling ❑ Combinatorics ❑ Logic ❑

Group theory ❑ Other abstract algebra (specify) _____ ❑

Others (please specify) _____ ❑

Q4 How important do you think definitions are in **first** year mathematics?

Not at all important ◯ Not very important ◯ Neutral ◯ Important ◯ Very important ◯

Q5 Is the approach in **first** year mathematics at your university:

Symbolic, procedural ❑ Axiomatic, formal ❑ Either, depending on the course ❑

Other (please specify) _____ ☐

Q6 Do you have a course that explicitly teaches methods of proof construction?

Yes ❍ No ❍

What year is it offered? 1 ❍ 2 ❍ 3 ❍ 4 or higher ❍

If yes, what teaching methods does it use?

Q7 Does your university have a mathematical course/activity dedicated to mathematical modelling and applications? Or are mathematical modelling and applications contents/activities integrated into other mathematical courses?

Dedicated course ❑ Integrated courses ❑ No such courses ❑

What kind of modelling courses do you think are more appropriate, and why?

3–Mathematics and transition

Q1 Do you think students have any problems in moving from school to university mathematics?

Yes ❍ No ❍

If yes, describe briefly what they are.

Q2 Do you think the transition from secondary to university education in mathematics should be smooth?

Yes ❍ No ❍

Why?

Q3 If you answered 'Yes' to Q2 above please say what could be done to make the transition from secondary to university education in mathematics smoother? (Otherwise go to Q4)

Q4 How would you rate first year students' mathematical understanding of each of the following on entry to university? Rate understanding of each from 1 (low) to 5 (high).

Algebra (of Generalised Arithmetic)	1 ◯	2 ◯	3 ◯	4 ◯	5 ◯	Can't say ◯
Functions	1 ◯	2 ◯	3 ◯	4 ◯	5 ◯	Can't say ◯
Real numbers	1 ◯	2 ◯	3 ◯	4 ◯	5 ◯	Can't say ◯
Complex numbers	1 ◯	2 ◯	3 ◯	4 ◯	5 ◯	Can't say ◯
Limits	1 ◯	2 ◯	3 ◯	4 ◯	5 ◯	Can't say ◯
Differentiation	1 ◯	2 ◯	3 ◯	4 ◯	5 ◯	Can't say ◯
Riemann Integration	1 ◯	2 ◯	3 ◯	4 ◯	5 ◯	Can't say ◯
Sequences and Series	1 ◯	2 ◯	3 ◯	4 ◯	5 ◯	Can't say ◯
Matrix algebra	1 ◯	2 ◯	3 ◯	4 ◯	5 ◯	Can't say ◯
Vectors	1 ◯	2 ◯	3 ◯	4 ◯	5 ◯	Can't say ◯
Proof	1 ◯	2 ◯	3 ◯	4 ◯	5 ◯	Can't say ◯
Definitions	1 ◯	2 ◯	3 ◯	4 ◯	5 ◯	Can't say ◯

Q5 In your opinion, how well does pre-calculus at secondary school prepare students to study calculus at university? (If your students study calculus at school please answer Q6 instead)

Very poorly ◯ Poorly ◯ Satisfactorily ◯ Well ◯ Very well ◯ Can't say ◯

Q6 In your opinion, how well does secondary school calculus prepare students to study calculus at university?

Very poorly ◯ Poorly ◯ Satisfactorily ◯ Well ◯ Very well ◯ Can't say ◯

Q7 In your opinion, how well does secondary school calculus prepare students to study analysis at university?

Very poorly ◯ Poorly ◯ Satisfactorily ◯ Well ◯ Very well ◯ Can't say ◯

Q8 How useful do you think that a course that includes assistance with the following would be for students? Rate the usefulness of each from 1 (low) to 5 (high).

Learning how to read a proof	1 ◯	2 ◯	3 ◯	4 ◯	5 ◯	Can't say ◯
Working on counterexamples	1 ◯	2 ◯	3 ◯	4 ◯	5 ◯	Can't say ◯
Building conjectures	1 ◯	2 ◯	3 ◯	4 ◯	5 ◯	Can't say ◯
Constructing definitions	1 ◯	2 ◯	3 ◯	4 ◯	5 ◯	Can't say ◯

Q9 Do the secondary schools in your location have mathematical courses dedicated to mathematical modelling and applications? Or are mathematical modelling and applications integrated into other mathematical courses?

Dedicated course ❑ Integrated courses ❑ No such courses ❑

What kind of approach do you think is more appropriate, and why?

Q10 What do you see as the key differences between the teaching and learning of modelling and applications in secondary schools and university, if any?

Q11 What are the key difficulties for student transition from secondary school to university in the field of mathematical modelling and applications, if any?

Q12 Are your first year mathematics students permitted to use calculators for most coursework?

Yes ❍ No ❍

If yes, which kind(s)?

Scientific ❑ Graphic ❑ Computer algebra system (CAS) ❑ Other_____ ❑

Q13 Are your first year mathematics students permitted to use calculators in most examinations?

Yes ❍ No ❍

If yes, which kind(s)?

Scientific ❑ Graphic ❑ Computer algebra system (CAS) ❑ Other_____ ❑

Q14 Do your first year mathematics students rely too much on calculators? Yes ❍ No ❍

Additional comments:

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COMPLETION OF THIS PART IS NOT NECESSARY FOR RETURN OF THIS QUESTIONNAIRE

I would be happy to be contacted for further information.

Name: _____ Position: _____

University: _____

Contact details: _____