MORE VIEWS OF M202

Dr. Ian Dey - M202 Course Team

One's views change with time, and certainly my own view of M202 has
changed with the passing of this course. When we started planning the
course in 1971 my feelings were ones of elation; at last we could teach
some 'real' pure mathematics; away with the differential equations and
on with the concepts and ideas of algebra, my favourite topic, and
topology.

Now I feel just sadness and depression, not because we have finished
producing the course, nor because it was not quite the course we had
in mind at the beginning (every course must inevitably end up like that),
but because of the student reaction to the course from one end of the
country to the other (literally.) "It's too hard", "why does it take
longer each week than M201", "the questions are impossible" and so on.
I feel a tremendous let down that all those hours spent thinking and
writing and rewriting, using all the experience from producing previous
courses to produce what I thought would be an attractive appealing
course, with plenty of help, more help than ever before, for those now
suffering from this course. I have personally taught much of the
content of this course many times over the years.   I have even used many
of the questions in this previous teaching, and never before have I met
this reaction to this material.

Well, there is my current view, which will no doubt change again when
we come to rewrite the course (in 7 or 8 years time.) By that time I
hope to be able to think dispassionately about the course, so that we
can analyse precisely where your difficulties lie, but until that time,
back to the gloom.

Richard Ahrens - Staff Tutor, London and M202 Examiner

It is impossible to answer the question: "Is M202 a fair 2nd-level
course" by simply examining a list of its contents. Mathematics can be
appreciated at many different levels - it is one thing to read and
understand someone else's proof of a theorem, it is quite another to
invent and write down your own proof of the same theorem. I would still
hope that all our students can gain a great deal of satisfaction from
M202 by being introduced to some exciting and beautiful maths.

A much more important problem for the student is: "At what level of
ability am I expected to perform ?" The only clear indicators of what
the Course Team expects of you are the assignment questions, and here
we have been guilty of some lack of judgment. I am afraid that the
student will just have to trust that the examination board will take
the difficulty of the assignment questions into account when awarding
credits. Let me hasten to assure everyone that a more fairminded and
sympathetic body has never before been assembled.

<u>Dr. John Mason</u>: - 'Chief Architect' of M202

The most perceptive comment I have heard is that in M202 we have presented the material, not taught it, but I don't agree with it at face value. In fact, we have done our very best to present the material clearly and logically. In that sense, we have indeed <u>taught</u> it. I am personally very dubious about the verb <u>teach</u> - to teach someone is impossible, to provide a context in which someone can learn <u>is</u> possible. In this sense I think we have done a lot, especially when compared to the texts that are available. We have made available to the student a good-sized chunk of pure mathematics.

The assessment questions probably have the biggest effect on a student's studying habits and self-confidence, and this year the questions proved to be harder than anticipated. The selection of questions is the hardest part of writing a course, and the least rewarding. It deserves far more energy than we have available.

My personal view is that the learning of mathematics is anything <u>but</u> a linear process, yet the correspondence texts, combined with your incredible dedication, bring about a linear learning pattern. Somehow we must help you to change this.

<u>John Bennett</u> - M202 student

Does M202 need to be defended ? The reactions in Newsletter 6 suggest that the course is giving a lot of trouble and that it is a near disaster. Now there are weaknesses, but I believe these are the problems of any new course aggravated by the intensity of the material. When they revise M202 I hope they expand the Minsky units, dispensing with the actual textbooks, and replace all references to M100 with explicit introductions to topics.

However, the course seems to me to have the right content, and indeed there must be an OU course covering the algebra and topology at least. M202 may need a bit of polishing, but this is real, and sometimes recent, mathematics; if it were very easy it would not be part of a degree course.

<u>EDITORIAL</u>

More contributions have been received than could be fitted into this issue, and the remainder are being reserved for No.8 (October) Contributions ere still needed - even for No. 8 - the Newsletter is quite insatiable. So let rip, and let's hear from you.

While anonymous readers and contributors are very welcome, the primary object of the Newsletter is to facilitate inter-student/ student-staff contact. This is one area where the OU has signally failed, and wherever possible, we would like readers to permit publication of their addresses etc. in the M.O.U.T.H.S. list.

Anyone who has not yet returned some sort of vote for or against continuation into 1974, please find five minutes to do so - preferably now, but during November at the latest!

AFTER B.A., A NEW JOB ? - M100 student, Poole.

I am a professional applied mathematician employed in industry, taking M100 and M251 this year as an updating exercise in 'modern' maths. Until recently I used to he one of Harry Hitch's problem solvers at the British Aircraft Corporation (ref. M100 TV programme), but last year I switched to the Systems Development Group of the same company at Hurn Airport, where I administer the section of analyst/programmers.

This company is one of the few places outside the academic world where mathematics graduates can obtain relevant employment. Furthermore, this employment is of a visibly productive nature where the end result flaps its fin and takes off for Majorca or wherever.

Consequently I would recommend, expect or hope that OU graduates will be taking their places among the newcomers to this group in the due course of time. Also, I hope they will find comfort in the thought that at least someone here knows something of the self-inflicted torture required to achieve the illusive credits of the B.A.(OU).

A NOTS ON RULED SURFACES PROVOKED BY MICHAEL GREGORY IN No.6

1. The set of tangents to a smooth twisted curve (twisted means the curve cannot be drawn in a plane) form a mathematically interesting surface called a developable surface. There are in fact 2 sheets to the surface which meet in a cusp along the given curve. Developable surfaces are 'isometric' with the plane, which means that such a surface could be flattened to a plane surface without stretching. (Much more restrictive than homeopathic.) Antoine Pevsner (he was Gabo's elder brother) has made a very fine metal sculpture of a developable surface. Don't drill the holes too close together because the threads are going to get very crowded along the cusp.

2. A famous theorem asserts that on a general cubic surface ('general' means not 'special' in any way) there are 27 straight lines. Each line intersects 10 other lines. It is quite difficult to arrange a model which has all the intersections shown, and I don't think it has been done in an aesthetically pleasing way. Given the 27 lines it might even be possible to fill the spaces between them with some membrane and give a good approximation to the cubic surface. This is something I would love to see as my imagination is not up to visualising the graph of:

$$ax^3 + by^3 + cz^3 + dx^2y + ex^2z + fxy^2 + gy^2z + hxz^2 + kyz^2 \cdots = 0$$

The arithmetic is going to be frightful so don't try it before the exams are over.

<div align="right">Richard Ahrens</div>

CASH SITUATION

The following voluntary subscriptions/donations have been received with astonishment and gratitude (and will, of course, be returned in the event of sudden demise of the Newsletter.)

M100 student, Poole	£ 1
Gordon Toung (S-T, Scotland)	£ 1
Peter Weir (M100, Coventry)	£ 4.40

PROBLEM CORNER No.7

Squaring the balls - Geoffrey Yates (M201/M202)
Consider a pyramid of balls, with a square base. The height is not given.
How many balls are there, if the total number of balls is a perfect square?
Only one answer has been found to date, apart from 1.

Further problem - Marion Stubbs

When you have located one (or more) answers, consider the related problem
of fitting all the little square layers into one big plane square. (If
you succeed, apply to Prof. Bruckheimer for a PhD.)

A problem of notation - John Mason, Bletchley

Here is an exercise in notation. Just write down what it says in your
own language, try one or two examples to see what it says, and the solution
should pop out.

If $f: S \rightarrow T$, then $\exists\, t$, $\left| f^{-1}(t) \right| \geqslant \left[\!\left[\dfrac{|S|}{|f(S)|} \right]\!\right]$ (S is a finite set)

where $f^{-1}(t) = \left\{ s: f(s) = t \right\}$

     $|X|$ =   size, or cardinality, of the set X

     $[\![y]\!]$ =   least integer greater than or equal to y,

         so $[\![\tfrac{1}{2}]\!] = 1$, $[\![1]\!] = 1$

(This contains the pigeon-hole principle as a special case.)

(Ed: The pigeon-hole principle goes thus:If n objects are distributed
over m places, and if n is greater than m, then some place receives at
least two objects.)

Barbers - Richard Straley (A302/A303)

Two rules govern the movement in and out of the shop of three barbers,
Allen, Brown and Carr.
1.   If Carr goes out, then if Allen goes out, Brown does not go out.
2.   If Allen goes out, Brown goes out.

Q: Under these conditions, can Carr ever go out ?

Solutions to Problem Corner No. 6 are somewhat lengthy, but will be
supplied on request.

FUNNIES - R.H. Smith (M201)

After the Flood, Noah told the animals to go upon the face of the earth
and to multiply. An interval passed, and the adders came back looking
very sad - they could only add. But Noah bade them go forth again and
see what they could do. They returned, wagging their tails. They had found
some logs and so could multiply by addition.

LETTERS TO THE EDITOR
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I have been pleased to receive the M00 Newsletter and would like to go
on receiving it. We may have two or three second-level maths students
next year.

We are very isolated here - only the M100 students who are doing well
contact me from Guernsey - I then find that the others have withdrawn.

The Open University are now realising that Jersey and Guernsey are
separate islands - a fact which incidentally has only just penetrated
to the Kennel Club.
Yours, Charles Green (M100 Counsellor, Jersey)

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I am very pleased to meet you and wonder if our introduction was a result
of the rather vivid stream of letters I have written to Bletchley this
year, none of which the 'enemy' deemed worthy of reply.

It was with delight I read the 202 comments. My particular concern is
that we are being subjected to the automata treatment (spasmodically
through the year I have pinched myself to reassure myself that the outside
at least is still human) because of the ambitions and 'in-fighting' of
the Mathematics academics. Isn't this need to keep up standards for
external review now quite obsolete ? How I would like to see the
Mathematics Faculty returning to the educational ideals that flickered
through M100.

Am I really sane to continue the love/hate relationship I have with this
course ?
Yours, Yvonne Kedge (M202, [...].)

                              ++++++

I came by your newsletter by Mike Pinch, this being the first time I had
heard of it. Maths students on the Isle of Wight feel rather isolated
as we find it difficult to get to tutorials. Also, although Cowes is
nearest to Southampton, we are allocated to Portsmouth or Fareham
I am very severely disabled (polio 16 years ago) and I am at home most
days and evenings. I would welcome phone calls from students doing my
courses or who are interested in doing them next year.
Yours, Gill Whitworth (M251/MST282/T241/TS282, Cowes, IoW)

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My suggestion for the new title of the newsletter is "M500". Why ?
1) Why not 2) "a top-level course in communications. Full credit"
3) It's an overview of OU maths 4) Why not 6) I thought of it.
Peter Weir (M100, Coventry)

(Ed: Does anyone have any cogent arguments against reason no. 5?
     Title accepted with enthusiasm - probably due to reasons
     1, 4, 2, 3 and 6, in that order.)

DATADOPE - NEWSLETTER No. 7

This issue runs to 3 sheets of paper. Cost of 200 copies @ £1 per ream is:

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        6 stencills @ 5p        0.30
        1½ reams of paper       1.50
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Whence, please note Q.6 on the appended form

MORE M.O.U.T.H.S.

[...]

[EK - This list includes Peter Weir who named the Newsletter and thus the Society, and became a Committee member.]