

MATH35001 2019-20: Feedback on feedback ¹

I'm supposed to give you feedback on your UEQ Responses because our management believes that this makes you happy. Having looked through what you said, you seem to be pretty happy already (I've attached the report so you can check!), and I am too.

- Issues that arise every year (and will continue to do so) are my handwriting and the fact that I talk fast. Maybe even too fast. Am aware of both, obviously, but it's hard to change. Honest! You were encouraged to shout at me (and sometimes did) when anything was unclear.
- Specific issues:
 - “DESPITE OTHER COMPLAINTS, HANDWRITING WAS LEGIBLE 99% OF THE TIME”
Ha!
 - “I JUST THINK STUDENTS WOULD FIND IT HELPFUL IF THEY WERE SOME ONLINE NOTES. THESE COULD COME OUT AFTER EACH LECTURE,...”
I'm confused. I do provide scans of my visualiser notes after each lecture and also post (brief, or rather: concise!) summary pdf files when a new chapter has been covered. I'm not going to write a book to accompany the lecture!
 - “ALSO THINK ITS A SHAME THE COURSE ISN'T STILL DONE WITH WEEKLY COURSEWORK OR EVEN FORTNIGHTLY. AS PERSONALLY I LIKE THE IDEA AND I'VE FOUND MYSELF PUTTING VISCOUS OFF AS I FOCUSED ON MODULES WITH COURSEWORK”
Sorry, guys! I've explained this at the beginning of the lecture. You are final-year students and should have learned how to study by now without me sitting there dangling carrots or cracking whips. Ask yourself if you would quote that last sentence in a job interview, say. My (possibly wrong!) interpretation of this sentence is “If you don't force me to work, I won't” which is fair enough, but that's your (grown-up?) decision. We're a university not a kindergarten (though, admittedly we sometimes give that impression, despite my best attempts to stop this!).
 - “ALSO, EVEN THOUGH NUMERICAL METHODS ARE NOT PART OF THE COURSE, AN OPTIONAL PROBLEMS/MATERIAL FOR NUMERICAL APPROACH WOULD HAVE BEEN GREAT.”
As I've said, I'm a great fan of numerical methods but they really aren't part of this course, and sadly, solving the Navier-Stokes equations numerically is a bit too complicated to cover this via some brief extra material. If you want to know more, do a project with me!

¹Any feedback on the feedback on the feedback to: *M.Heil@maths.manchester.ac.uk*

University of Manchester
2019-20 Semester 1 Mathematics (UG & PG)

Course: I3133-MATH-35001-1191-1SE-009278: MATH35001 Viscous Fluid Flow 2019-20 1st Semester
Instructor: Matthias Heil *
Response Rate: 43/87 (49.43 %)

1 - Overall, I would rate this unit as being excellent.

| Response Option | Weight | Frequency | Percent | Percent Responses | Means | | | |
|----------------------------|-------------|------------|---------------|-----------------------|----------|----------------|------------|---------------|
| Agree | (5) | 30 | 69.77% | | | 4.63 | 4.25 | |
| Mostly Agree | (4) | 11 | 25.58% | | | | | |
| Neither Agree Nor Disagree | (3) | 1 | 2.33% | | | | | |
| Mostly Disagree | (2) | 1 | 2.33% | | | | | |
| Disagree | (1) | 0 | 0.00% | | | | | |
| | | | | 0 25 50 100 | Question | School BM Data | | |
| Response Rate | Mean | STD | Median | School BM Data | | Mean | STD | Median |
| 43/87 (49.43%) | 4.63 | 0.66 | 5.00 | 2598 | | 4.25 | 0.98 | 5.00 |

2 - The feedback that I received on my work was helpful.

| Response Option | Weight | Frequency | Percent | Percent Responses | Means | | | |
|----------------------------|-------------|------------|---------------|-----------------------|----------|----------------|------------|---------------|
| Agree | (5) | 18 | 41.86% | | | 4.02 | 4.19 | |
| Mostly Agree | (4) | 10 | 23.26% | | | | | |
| Neither Agree Nor Disagree | (3) | 13 | 30.23% | | | | | |
| Mostly Disagree | (2) | 2 | 4.65% | | | | | |
| Disagree | (1) | 0 | 0.00% | | | | | |
| | | | | 0 25 50 100 | Question | School BM Data | | |
| Response Rate | Mean | STD | Median | School BM Data | | Mean | STD | Median |
| 43/87 (49.43%) | 4.02 | 0.96 | 4.00 | 2598 | | 4.19 | 1.02 | 5.00 |

3 - This unit was well organised.

| Response Option | Weight | Frequency | Percent | Percent Responses | Means | | | |
|----------------------------|-------------|------------|---------------|-----------------------|----------|----------------|------------|---------------|
| Agree | (5) | 32 | 74.42% | | | 4.70 | 4.36 | |
| Mostly Agree | (4) | 9 | 20.93% | | | | | |
| Neither Agree Nor Disagree | (3) | 2 | 4.65% | | | | | |
| Mostly Disagree | (2) | 0 | 0.00% | | | | | |
| Disagree | (1) | 0 | 0.00% | | | | | |
| | | | | 0 25 50 100 | Question | School BM Data | | |
| Response Rate | Mean | STD | Median | School BM Data | | Mean | STD | Median |
| 43/87 (49.43%) | 4.70 | 0.56 | 5.00 | 2598 | | 4.36 | 0.93 | 5.00 |

4 - The course materials were helpful.

| Response Option | Weight | Frequency | Percent | Percent Responses | Means | | | |
|----------------------------|-------------|------------|---------------|-----------------------|----------|----------------|------------|---------------|
| Agree | (5) | 30 | 69.77% | | | 4.63 | 4.43 | |
| Mostly Agree | (4) | 11 | 25.58% | | | | | |
| Neither Agree Nor Disagree | (3) | 1 | 2.33% | | | | | |
| Mostly Disagree | (2) | 1 | 2.33% | | | | | |
| Disagree | (1) | 0 | 0.00% | | | | | |
| | | | | 0 25 50 100 | Question | School BM Data | | |
| Response Rate | Mean | STD | Median | School BM Data | | Mean | STD | Median |
| 43/87 (49.43%) | 4.63 | 0.66 | 5.00 | 2598 | | 4.43 | 0.88 | 5.00 |

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| 5 - The support classes were helpful. | | | | | | | | | |
|---------------------------------------|--------|-----------|---------|-------------------|----------|----------------|------|--------|--|
| Response Option | Weight | Frequency | Percent | Percent Responses | Means | | | | |
| Agree | (5) | 32 | 74.42% | | | | | | |
| Mostly Agree | (4) | 6 | 13.95% | | | | | | |
| Neither Agree Nor Disagree | (3) | 5 | 11.63% | | | | | | |
| Mostly Disagree | (2) | 0 | 0.00% | | | | | | |
| Disagree | (1) | 0 | 0.00% | | | | | | |
| | | | | 0 25 50 100 | Question | School BM Data | | | |
| Response Rate | Mean | STD | Median | School BM Data | | Mean | STD | Median | |
| 43/87 (49.43%) | 4.63 | 0.69 | 5.00 | 2598 | | 4.23 | 1.02 | 5.00 | |

| 6 - The digital resources and/or online activities provided in this unit supported my learning experience. | | | | | | | | | |
|--|--------|-----------|---------|-------------------|----------|----------------|------|--------|--|
| Response Option | Weight | Frequency | Percent | Percent Responses | Means | | | | |
| Agree | (5) | 28 | 65.12% | | | | | | |
| Mostly Agree | (4) | 10 | 23.26% | | | | | | |
| Neither Agree nor Disagree | (3) | 3 | 6.98% | | | | | | |
| Mostly Disagree | (2) | 1 | 2.33% | | | | | | |
| Disagree | (1) | 1 | 2.33% | | | | | | |
| | | | | 0 25 50 100 | Question | School BM Data | | | |
| Response Rate | Mean | STD | Median | School BM Data | | Mean | STD | Median | |
| 43/87 (49.43%) | 4.47 | 0.91 | 5.00 | 2598 | | 4.36 | 0.95 | 5.00 | |

| 7 - Prof/Dr. Matthias Heil's teaching was excellent. - | | | | | | | | | |
|--|--------|-----------|---------|-------------------|----------|----------------|------|--------|--|
| Response Option | Weight | Frequency | Percent | Percent Responses | Means | | | | |
| Agree | (5) | 37 | 86.05% | | | | | | |
| Mostly Agree | (4) | 6 | 13.95% | | | | | | |
| Neither Agree nor Disagree | (3) | 0 | 0.00% | | | | | | |
| Mostly Disagree | (2) | 0 | 0.00% | | | | | | |
| Disagree | (1) | 0 | 0.00% | | | | | | |
| I have not been taught by this lecturer | (0) | 0 | 0.00% | | | | | | |
| | | | | 0 25 50 100 | Question | School BM Data | | | |
| Response Rate | Mean | STD | Median | School BM Data | | Mean | STD | Median | |
| 43/87 (49.43%) | 4.86 | 0.35 | 5.00 | 3529 | | 4.25 | 1.07 | 5.00 | |

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2019-20 Semester 1 Mathematics (UG & PG)

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8 - What aspect of Prof. /Dr. Matthias Heil's approach to teaching best helped your learning? -

| Response Rate | 34/87 (39.08%) |
|---------------|----------------|
|---------------|----------------|

- His humour and enthusiasm.
- Matthias is a great lecturer. The course is at the right level and the lectures are always structured nicely. He is funny and engaging, and I enjoyed every lecture. The material is also really interesting!
- How he uses the projector and the clear format and structure he teaches his lectures in. He's also easy to approach and ask for help. (Could still work on his u's and v's but have accepted that it'll never happen)
- Amazing lecturer, very funny and charismatic! Definitely one of the nicest lecturers I had so far.
- Lectures are not a silent grind of writing copious pages of notes. There's a relaxed approach of discussing the mathematics during lectures and skipping unnecessary algebra. Lecture notes and online notes "compliment each other" as opposed to a lot of other courses where lecturers follow nearly word for word the online notes, making it pointless to come in - why not just read them at home?
- Despite other complaints, handwriting was legible 99% of the time
- Dr. Heil is a very good professor overall. Sometimes the pace of the lecture is too slow and I feel that we spend a lot of time discussing very obvious things and we could use that time to practice problems. An example would be when in an example class for Examples 7 we discussed about dimensional analysis and we spent a lot of time discussing dimensions of quantities and dimensional consistency of equations.
- Clear structure to the course.
- Enthusiasm (and humour).
- Entertaining style of Lecturing helps to keep attention
- Good podcasts and lots of examples
- He was a fun lecturer who clearly enjoyed what he was lecturing.
- The enthusiasm and rigorosity
- Excellent and thorough explanations made it an extremely easy course to follow
- Lectures always clear, good pace and often entertaining!
- Entertaining and engaging delivery, also expanded on the real world applications of the fluid mechanics which was interesting, or how the situations described would diverge from the predicted model due to non-linear effects.
- Engaging lectures
- His lectures are extremely good, good explanation, approachable in terms of asking a question which is a very good quality.
- Good pace in lectures, good summary notes
- One of the best professors I've had in my time at University! Lovely chap! :)
- The approach of working from the ground up is a good way of making sure no concepts seem vague or confusing. Going through almost everything in detail pays off!
- The few times he didn't attempt to be funny. Allowed me not fall into a depressive episode over what he views as humour, allowing me to engage more with the lecture material.
- Witty Germanic mannerisms
- Blunt and straight to the point is helpful, means less proof of things and more of actually doing applications
- I really feel Matthias wants the student to understand the content. Not just how to pass an exam, but makes it clear why we do something and why it works. This is exactly what I want in a lecturer. Also very enthusiastic and awesome.
- Clear and friendly delivery of lectures, and physical explanations of the mathematical concepts.
- His knowledge of both the subject and what other students have struggled with in the past
- Things were taught more in a way where you respected what was happening to actual fluid, rather than just loads of rigorous maths on page.
- very concise manner, stressing important points / subtle aspects (e.g. where and why to use Stoke's limit instead of full NSt eqns) rather than doing algebra. General maths concepts (e.g. dimensional scaling, BCs for ODEs etc) are helpful
- Teaching was excellent. Being aware that many of us use the podcasts and making sure that everything was captured e.g. by using visualiser etc.
- A good lecture that makes you want to go to lectures
- Clear, sometimes funny lectures, made it entertaining
- Extensive use of examples very much helped my ability to answer questions and lectures were delivered in a lively, engaging way
- The lectures were good and clear. The solutions to example sheets could be more clear as sometimes I found them difficult to follow if I couldn't quite work out where something came from. Also the online lecture notes are extremely brief towards the end.

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9 - Please provide details of what you valued about this unit.

| Response Rate | 24/87 (27.59%) |
|---------------|----------------|
|---------------|----------------|

- The pace of his lectures was ideal and because of his enthusiasm you were always paying attention.
- I liked going over lots of examples!
- It was interesting
- I loved the structure of this course, especially the fact that we took the time to go through the basic concepts and from there make our way to the Navier-Stokes equations (which I personally find a million times better than simply writing them down and then attempting to solve them). I also found the online lecture notes to be very nicely written and useful.
- Finding solutions to the Navier-Stokes equations, albiet for extremely simple cases, is still pretty cool.
- This module was very accessible as a physics student taking the course. Better taught than many physics modules and the lecturer explains concepts very clearly.
- Matthias bless u such a funny lecturer and the content was explained clearly in an easy to follow manner
- Entertaining lecturing, but still maintained a focus on the content and a good structure
- Lots of examples
- I valued the insights into fluid mechanics, which I had no prior experience with
- Material was organized in a clear way and easy to follow
- Really good examples classes compared to other modules I've taken
- Lectures were good. Material was good. Problem sheets only included relevant questions which is good.
- The examples sheets were stimulating, challenging but manageable. The examples classes were always useful in unpacking these sheets and deepening my understanding of the subject. The lectures were always enjoyable, Matthias is a great teacher!
- Example sheets are good, experiment in the example class and drawing explained steps along the way really helped understanding. I also liked that occasionally, the example class would be a lecture thus eventually giving us the final week of the semester off which is excellent
- His daughter is pretty cool.
- The German guy
- Having the tutorials podcasted was a massive help to go back over if I missed anything
- Enjoyed learning about how the maths applied to physical world properties.
- concise introduction to continuum mechanics, very good for learning all basic concept
- Teaching, notes and solutions very clear.
- Matthias
- Fun
- The course complimented MATH35021 very well and acted as a strong and helpful introduction to continuum mechanics

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Response Rate: 43/87 (49.43 %)

10 - Please provide details of what you think could be improved on this unit.

| | |
|----------------------|----------------|
| Response Rate | 30/87 (34.48%) |
|----------------------|----------------|

- Bit more structure in the lectures (i.e. make it clear where there are definitions, theorems, examples, etc.)
- I'm not sure it needs any improvements!
- His handwriting
- This is my personal opinion: I think that at the very end of the course (provided there is enough time after covering all the examinable material), a new section can be added, one that provides some guidelines concerning possible numerical methods used for solving the Navier-Stokes equations. I understand this is probably a topic too broad to be covered this briefly, but I am sure there are lots of students who might be interested, especially by the end of this course.
- More material could have been covered in this course. A lot of time is spent on different flow examples and, whilst helpful, they could have easily been left to example sheets or online supplementary examples.
- NONE
- Yo, learn which chapter number is which :p (please)
- Some coursework, (1 reasonably sized piece so it doesn't take too long to mark!)
- V often looks like U
- Could provide more detailed written notes for if the podcast system is down and people have clashes
- Matthias' handwriting could be clearer
- Maybe include more (optional) problems in the example sheets
- Potentially include more detailed online notes for clarity and typed solutions would be clearer but overall a good course and well taught.
- Are there actual past papers on the course website? I've found past paper feedback and feedback on the feedback but so far there doesn't appear to be a link to any past exams. Perhaps a link to these on the website would reduce time spent finding them elsewhere?
- A midterm would be nice so I can check that I am on the right path of understanding
- Nothing
- I just think students would find it helpful if they were some online notes. These could come out after each lecture, or after all lectures have been completed. Just so when someone is trying to look back they can see a more detailed version of notes to help any confusion in any steps of workings. The summary notes are helpful but i think have summary and detailed notes would go a long way. Also think its a shame the course isn't still done with weekly coursework or even fortnightly. As personally i like the idea and I've found myself putting viscous off as i focused on modules with coursework
- More problems on the example sheets please, even if they essentially require the same approach and have no solutions. Also, even though numerical methods are not part of the course, an optional problems/material for numerical approach would have been great.
- His daughter only appeared to attend one lecture a week, in effect I only attended one lecture a week. What's the point if she's not present?
- More if the German guy
- There seemed to be a lot more content than all the other courses, made it a little harder to learn everything in detail. I also appreciate you don't want exam solutions online but you could put proper exam questions from over the years into examples classes.
- Maybe be slightly more careful with notation. E.g. he explains how a u and v are different in the lecture but when written down can sometimes not be clear.
- The pace was quite fast so it would be easy to get lost if you took too long to write the notes down.
- Nothing
- The rigorousness of obtaining the vorticity transport equation went quite fast.
- probably not many would criticize that, but I would love to see more challenging examples of NSt eqns; e.g. the observed experiment on bifurcations in viscous fluid flow, it looks like a lot of fun
- N/A (Don't give us a 9am)
- More detailed solns explaining why
- Nothing
- Visualiser slides were often poorly written, for example woolly language not using full sentences, some logic was disjointed and this made especially the early, more theoretical, part of the course difficult to follow