

HAX604X – Satisfaction survey (2024-2025)

Course name. Numerical analysis of differential equations.

Institution. Faculty of Sciences of Montpellier.

Audience. Pure & applied mathematics students.

Level. 3rd year of B.Sc.

Role. Tutorial classes, practical/coding classes and exams marking.

Contents

Chap. 1 – Introduction to Cauchy problems for ordinary differential equations

- Numerical methods for solving differential equations
- One-step methods : Euler, Runge-Kutta, error analysis, convergence
- Multistep methods : Adams, BDF, stability considerations
- Stiff problems and stability supplements

Chap. 2 – Introduction to partial differential equations

- First-order linear PDEs : constant coefficients, characteristics, conservation laws
- Finite difference methods : discretization principles, upwinding, stability, and other schemes
- Diffusion equations : heat equation, convolution solution, Fourier series, finite difference discretization
- Higher dimensions : Poisson equation

Objectives. As part of my doctoral journey and with the ambition of becoming a university lecturer, I conducted this satisfaction survey for the second year in a row. The goal is to gather direct feedback from students to help me evaluate and continuously improve my teaching practices. Their responses are essential for refining my methods and ensuring they meet the high standards expected in higher education.

Beyond personal development, this survey also offers a valuable perspective for future recruiters. It provides a transparent and authentic view of my teaching approach, as experienced firsthand by students. Through their feedback, it highlights key aspects such as the clarity of my explanations, the relevance of the course material, the overall effectiveness of the sessions, and the level of student engagement.

This semester, 15 students responded to the survey out of the 18~20 who attended regularly (from a total of 23 enrolled). Their feedback and detailed results are presented in the following pages.

Pedagogical method. Teaching third-year mathematics students comes with a different set of challenges compared to first/second-year audiences. The program is dense and ambitious, leaving little time for extended participative activities during tutorials. Nevertheless, I made it a point to maintain a personalized and interactive approach whenever possible.

Throughout the semester, I made sure to interact individually with as many students as possible, answering their questions not only on the exercises but also discussing broader aspects of mathematics and their academic paths. I regularly engaged students in conversations about their orientation choices, especially concerning potential master's programs, offering guidance based on their interests and strengths.

This year, I was in charge of two groups : one tutorial group (TD) focused mainly on theoretical aspects, and one practical session group (TP) dedicated to numerical programming, mainly in Python. This allowed me to balance the teaching between mathematical foundations and practical implementation, ensuring that students were equally comfortable with the underlying theory and its applications through coding.

Moreover, while the core of the tutorials remained focused on the technical content, I frequently allowed myself short digressions to delve deeper into broader topics of numerical and theoretical analysis. These moments, which linked practical methods to their underlying mathematical foundations, were very well received and helped foster a more profound understanding of the subject beyond the standard syllabus.

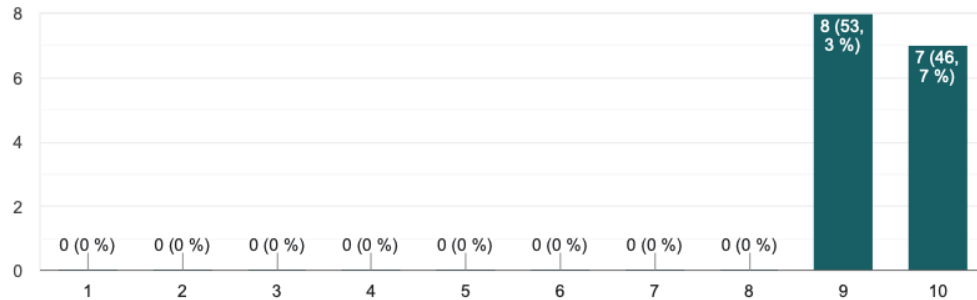
Survey results.

Final grade for my teachings : **9.46/10**.

 [Copier le graphique](#)

Final grade: your overall satisfaction with this tutorial and the supervisor? (note finale : ta satisfaction globale concernant ce TD/TP et l'encadrant ?)

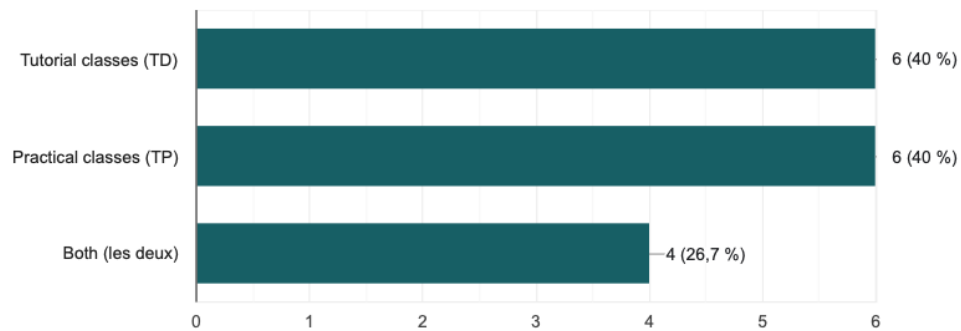
15 réponses



I am your teacher in...

 [Copier le graphique](#)

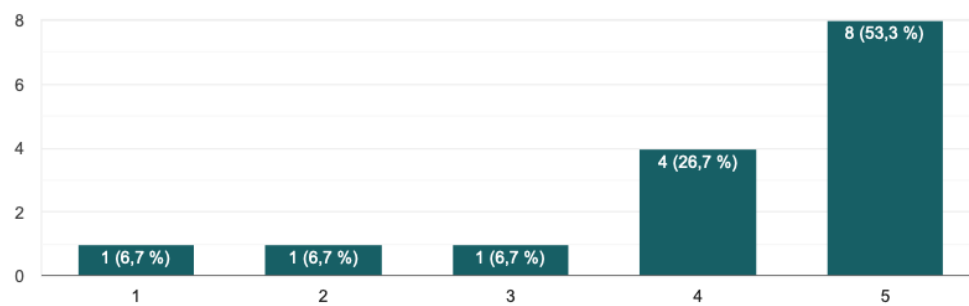
15 réponses



Involvement in tutorial classes (Niveau d'implication en TD/TP)

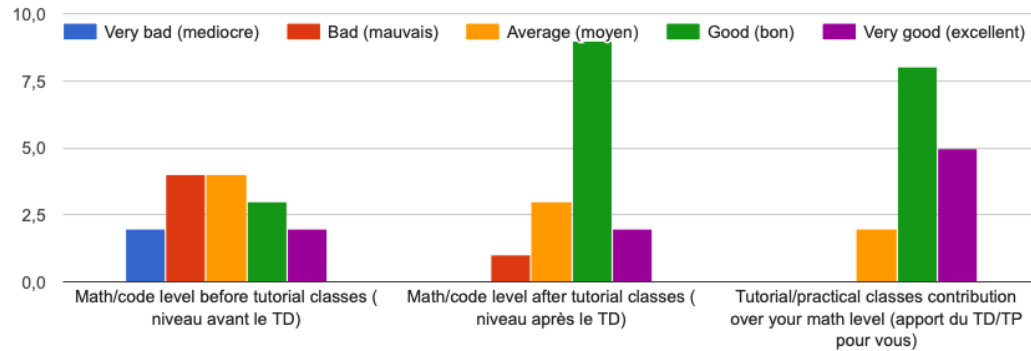
 [Copier le graphique](#)

15 réponses



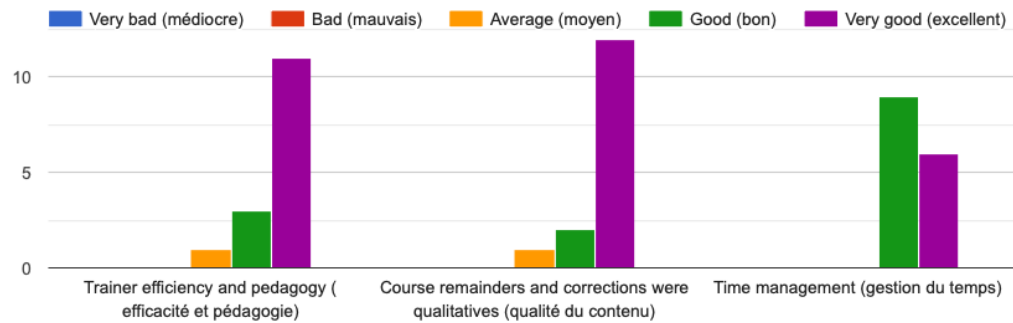
Contribution to learning (contribution à l'apprentissage ce semestre)

[Copier le graphique](#)



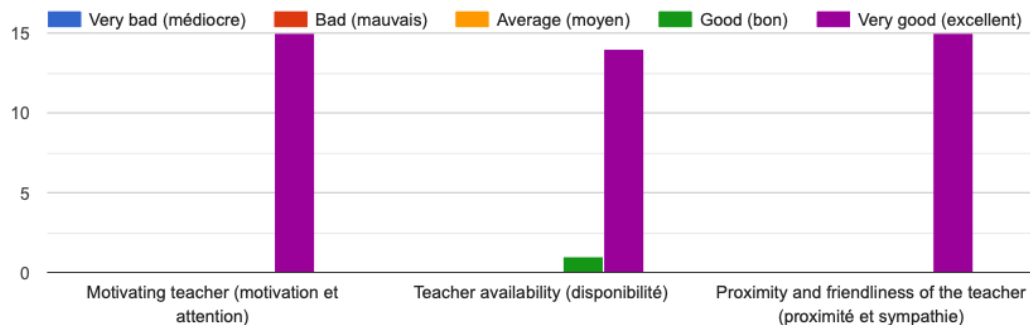
Trainer skills and responsiveness (compétences et réactivité de l'enseignant)

[Copier le graphique](#)



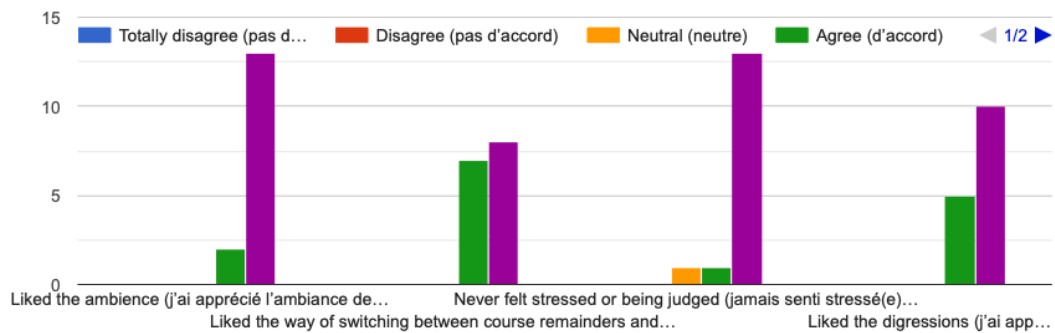
Trainer human qualities (qualités humaines de l'enseignant)

[Copier le graphique](#)



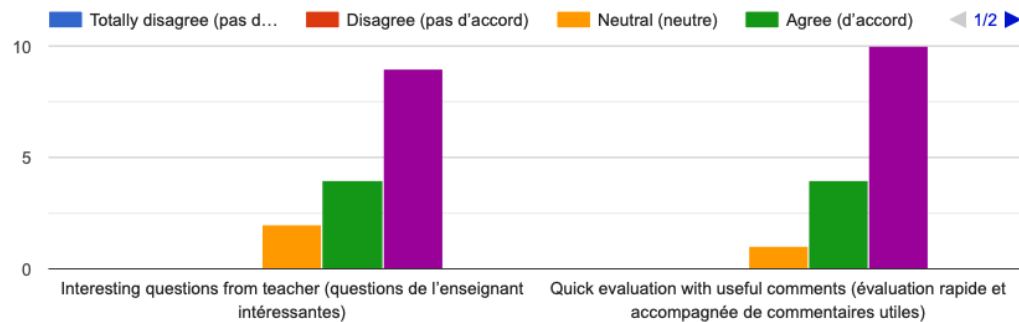
Atmosphere and activities (ambiance et activités)

[Copier le graphique](#)



Assessment (évaluation)

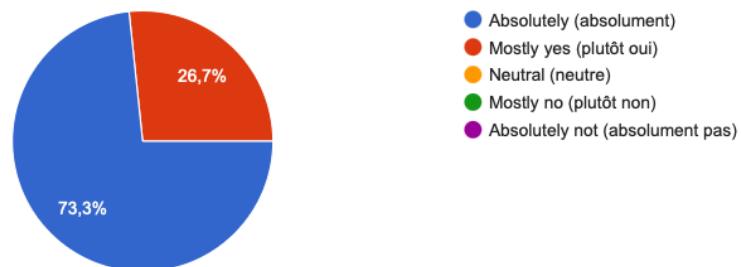
[Copier le graphique](#)



Has your vision of numerical analysis evolved positively between the start of this class and now? (est-ce que votre vision de l'analyse numérique a évolué positivement entre le début et maintenant ?)

[Copier le graphique](#)

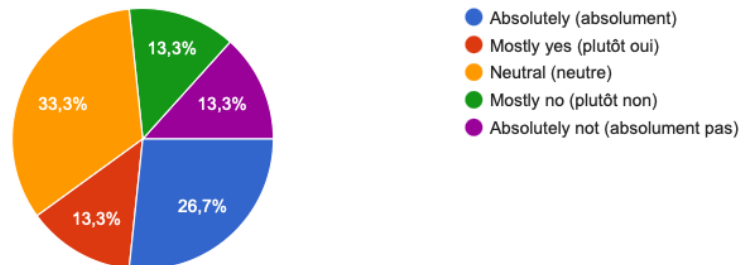
15 réponses



 [Copier le graphique](#)

Did your professor influence your choice of master's degree? (est-ce que votre professeur vous a influencé dans votre choix de master ?)

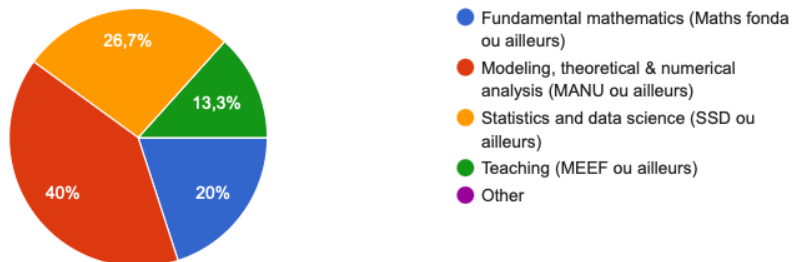
15 réponses




 [Copier le graphique](#)

Which type of master's degree do you want to pursue next year? (Quel type de master souhaitez vous suivre l'année prochaine ?)

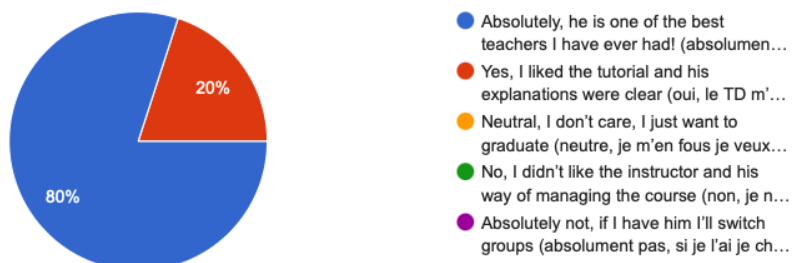
15 réponses



 [Copier le graphique](#)

Would you like to have your teacher back in lectures or tutorial classes one day? (souhaiteriez-vous un jour avoir votre encadrant de nouveau en CM ou TD/TP ?)

15 réponses



Positive aspects.

1. **Dedication and accessibility** : Students praised my strong investment in their success and the attention I gave to individual guidance, including discussions about their academic orientation and future master's programs.
2. **Teaching style and pedagogical skills** : My approach was described as both serious and motivating. Many students appreciated the balance between rigorous explanations and a dynamic, approachable atmosphere.
3. **Enrichment through broader perspectives** : The digressions on general topics in numerical and theoretical analysis were particularly valued. They helped students better understand the broader context of the subject and made the course feel more meaningful.
4. **Theory and practice balance** : Students appreciated the dual focus on theoretical concepts during tutorials and practical programming exercises (Python) during lab sessions. The practical sessions were especially valued for making abstract notions more concrete, helping students better grasp the mathematical methods by directly implementing them.
5. **Positive evolution of perception** : A large majority of students reported a positive evolution in their perception of numerical analysis throughout the semester, feeling more connected and engaged with the subject.

Suggestions for improvement.

1. **Time management during corrections** : Some students suggested being slightly more concise when correcting exercises in class to leave more time for additional discussions or exercises.
2. **Clarification of complex exercises** : A few students noted that some programming exercises could be difficult to understand when working alone, and suggested providing a few more hints or intermediate steps.
3. **Maintaining the rhythm** : Although most students appreciated the course rhythm, one comment suggested that a bit more structure in TP sessions could make the coding parts more fluid for those less comfortable with programming.

Personal note.

I feel truly fortunate to have taught such a serious, engaged, and motivated group of students this semester. Many of them displayed remarkable intellectual abilities, and I am confident that they will succeed in their future academic pursuits. It was actually a real pleasure to teach a more advanced audience at the third-year undergraduate level. Working with students who already had a solid mathematical background allowed for deeper discussions and a more dynamic progression throughout the course.

At the beginning of the semester, many students had very limited programming experience — some had never even printed a "Hello, world!" — and yet, by the end of the semester, they were able to implement numerical schemes to solve the heat equation. Witnessing such impressive progress in both theoretical understanding and practical skills was extremely rewarding.

As a small anecdote, after returning the results of the first continuous assessment — which were very encouraging — I distributed chocolates to celebrate their success and to congratulate them for their efforts.

Finally, to properly close this wonderful semester, I have planned to organize a small gathering where we can all meet again, share a snack, and celebrate the journey we have taken together.

Some of the nicest/funniest comments (translated).

- "A great teacher with a great charisma. Maybe he could solve the exercises earlier during the day instead of at 2 AM! But since he is busy with his PhD, it's understandable if that doesn't change — it really wasn't a major issue. The rest of the course was very well structured and there is nothing more to add."
- "I think Sacha is a very good teacher, who places human relationships at the heart of the classroom experience — something not all professors in higher education necessarily prioritize. His many digressions were a real asset, helping to popularize and give perspective on the exercises. Involving more students in the corrections could make the classroom atmosphere even more lively."
- "Nothing, you're perfect."
- "Would you like to grab some beers (or hit the gym) with students someday?"

- "Since I started studying at university, there have been two professors who truly left a strong impression on me : Professor C. and Professor D. They were outstanding at answering all questions, making enlightening digressions about important general results, always keeping the blackboard very clear, and consistently highlighting the key ideas. Compared to other professors — some are excellent but less structured, others transmit passion but their boards can be messy during tutorials — there are always one or two points that could be improved. From my point of view, even though I only had Mr. Cardonna in tutorials and practicals, he reaches the level of excellence of Professors C. and D. in teaching clarity and guidance."
- "My good sire! Would you care to partake in a convivial feast where homemade burgers (including the buns!) shall be prepared and enjoyed? We would be most honored by your presence, my lord. We hope you will join us at this banquet!"