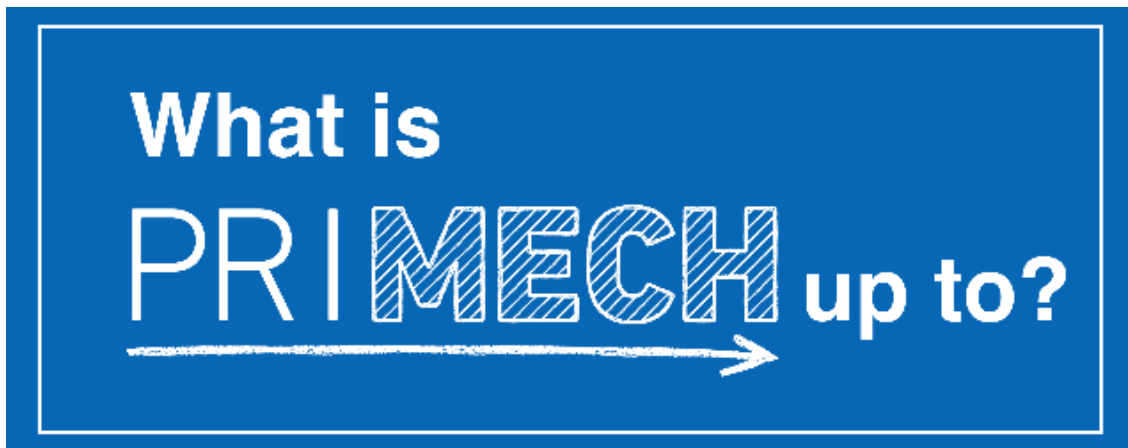


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Newsletter
Year:2024
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Hello PRIMECH Community!

Have you spotted our Alligator Accelerator lately? We're curious about its current ventures.

This newsletter covers a quick recap of our final event this academic year, introduces new PRIMECH objectives, shines a spotlight on an inspiring teacher, and much more. Dive in and enjoy!

In this newsletter:

- Last event recap: **PRIMECH season finale**
- **New PRIMECH objectives**
- Teacher in the Spotlight: **Bas Flipsen**, associate professor in IDE
- Monthly Mix:
 - Accelerating into summer: **Statics in Space** and **Experimental Box**
 - Memes of the month and happy holidays.

PRIMECH Season Finale

On Friday, June 14th, we hosted the "PRIMECH Season Finale" lunch event, which was a hit with over 30 participants! it was the last event of this academic year. If you couldn't attend, you can find all the presented materials and pictures on [PRIMECH's MS Teams](#).



The event kicked off with an **extended community lunch**, allowing everyone to relax and connect. Following lunch, Marta presented an **overview of PRIMECH's beginnings, this year's outcomes, and future plans**. Find out about those in the next section of this newsletter.



As **this was the last event organised by the current PRIMECH core team**, we wanted to **celebrate our community** by distributing growing paper cards with a goodbye message. We hope to see PRIMECH flowers sprouting in the future!

We also gifted plants to our award winners, including recognition for the PRIMECH members who completed the most accelerated projects and those who asked the most questions.

It was heartwarming to see members of our community cheerfully celebrating these years' achievements together.



Next, we engaged in the **Alligator Tank game**, where groups imagined themselves as part of the PRIMECH core team and brainstormed innovative and exciting PRIMECH activities. The enthusiasm was great as teams presented their ideas, and the group receiving the loudest applause (the coin idea) was awarded the prestigious PRIMECH cups!



We would like to thank all the members of the PRIMECH community for making these years both educational and enjoyable. As we mentioned in the card, **we hope you have found joy, connections, and valuable insights during this time.** We look forward to seeing the community foster more innovations in mechanics education together with you. We are grateful for the energy and dedication each of you has brought to the community








PRIMECH new objectives

PRIMECH was initiated with temporary funding set to conclude in 2024. Therefore, throughout this academic year, **we have been working with our Advisory Board to discuss the program's future directions and how PRIMECH could move forward to the next phase.**

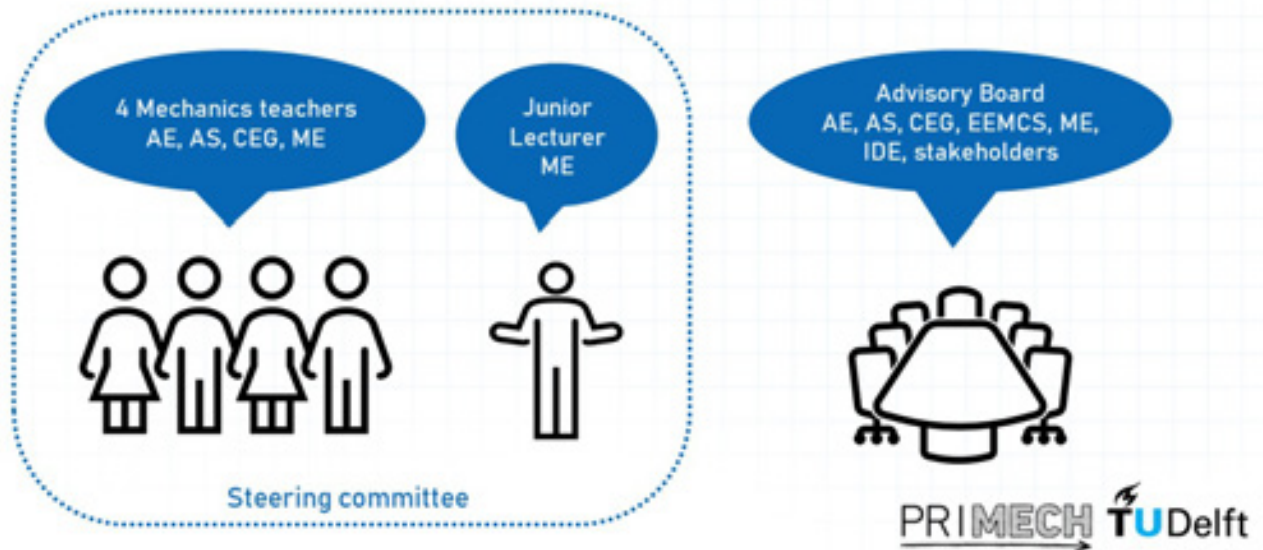
The Advisory Board is composed of mechanics teachers from different faculties, a member of the student council, and one representative from Central Education and Student Affairs. These are the new objectives we developed together:

New objectives

-  1. Sharing experiences, best practices and resources between mechanics teachers.
-  2. Facilitate discussions between teachers on what is good Mechanics education, innovative educational research outcomes, and methods.
-  3. Facilitate collaboration and co-development among mechanics teachers (of different courses, of different faculties).
-  4. Making mechanics education more recognized and rewarding for teachers.
-  5. Proactively supporting new mechanics teachers (new teachers, new to old course, new course).

To achieve these new objectives, a new core team will lead the community forward:

New core team



We are now in the process of creating the new steering committee and of the and ensuring a smooth handover.
We will present the new core team to you soon!

BAS FLIPSEN:

Associate Professor in IDE

- Who are you and what is your actual role at TU Delft?

I am Bas Flipsen, an associate professor in the Department of Sustainable Design Engineering. I coordinate several engineering courses in the bachelor's program, such as Understanding Product Engineering, and elective courses like Design for the Circular Economy. I also teach master's courses, including Products Now Design Studio and Repair & Recycling.

- Do you have any hobbies?

Together with my son, I am restoring a six-gear moped, the Derbi Senda Xtreme (OT). It's a great project to do with your son and learn about the technology behind this motorbike. I had theoretical knowledge, but practical experience always surpasses theory alone. Along with Stefan Persaud and my team, we focus on hands-on learning in the mechanics of materials. Together with two graduates, we are developing small machines to explore different manufacturing technologies like injection molding and vacuum forming.

- What are your plans on Mechanics education?

I love engineering and teaching skills and knowledge in the field. Most of my projects start with a product autopsy, where we reverse-engineer products to understand how they work, fit together, and are manufactured.

- According to you, what are the advantages of being in PRIMECH?

I am very glad to be part of the PRIMECH community, where I learn so much from my peers in the field about teaching mechanics of materials, motivating students to surpass themselves, and fair grading practices. Sharing experiences is the key to growing in the field and becoming an excellent tutor and engineering motivator.

Memes of the month,
XKCD edition:



The PRIMECH team wishes you a happy summer holiday! We will take a break from the newsletter and return at the end of August, ready to kick off the new academic year. **Stay tuned for exciting updates about the new PRIMECH core teams and our future plans.**



PRIMECH stands for **PR**ogramme of Innovation in **MECH**anics education. It is an interfaculty project started at TUDelft the 1st of October 2021. It has been initiated by the Student Council and supported by Education & Students Affairs. Our focus is on innovating **Bachelor level Mechanics courses**.

Currently, the **PRIMECH team members** are **Marta Gavioli**, project leader; **Veronica Comin**, events

coordinator; **Marijn Roelvink**, software developer; **Thijs Hoedemakers**, meme acquirer; **Fay Wolf**, graphic designer and **Hans Hellendoorn**; project supervisor.

You are receiving this newsletter because you have crossed paths with us in the last months.
We hope you enjoy staying informed about our progress!

For any feedback, please write to:
PRIMECH@tudelft.nl

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You can [update your preferences](#) or [unsubscribe](#)



Newsletter
Year:2024
Month:05

What is PRIMECH up to?

Hi there, mechanics enthusiasts!

Can you believe it's almost June? Time flies! In this newsletter, we're inviting you to our final event of the year, which is going to be fantastic. You'll also find insights on sustainability in education, meet an inspiring teacher in the spotlight, and much more. Enjoy!

In this newsletter:

- Invitation for our last event: **PRIMECH season finale**
- Last event recap: **Sustainability in Mechanics Education**
- **Engineering for One Planet** Framework
- Teacher in the Spotlight: **Manuela Hoogwerff**, junior lecturer at ME
- Monthly Mix:
 - Accelerate work-in-progress: **DiDATA**
 - Memes of the month



The poster features a blue background with a grid pattern. On the left, there is a black and white photograph of three people in conversation. On the right, another black and white photograph shows a man and a woman. The PRIMECH logo is in the top right corner. The main title 'PRIMECH Season Finale' is in large white letters, with the subtitle 'Let's celebrate and network together' below it. Three bullet points with icons provide event details: a location pin for '14 June 2024, Teaching Lab 12:00 - 14:00', a question mark for 'Join PRIMECH for this community lunch event filled with networking activities. Let's celebrate together the ending of the current core team's term and future plans!', and a pencil for 'Register on Primech.nl'. A lightbulb icon is also present.

PRIMECH

PRIMECH Season Finale

Let's celebrate and network together

- 📍 14 June 2024, Teaching Lab
12:00 - 14:00
- ❓ Join PRIMECH for this community lunch event filled with networking activities. Let's celebrate together the ending of the current core team's term and future plans!
- ✍️ Register on [Primech.nl](https://primech.nl)

Hello PRIMECH community!

Let's celebrate another year of PRIMECH and everyone who has contributed to the project with an extended community lunch!

WHEN: 14th of June, 12.00 to 14.00

WHERE: Teaching Lab, Building 32a [↕](#)

WHAT: Join us to honour the end of the academic year and the conclusion of the PRIMECH core team's term!

PRIMECH was initiated with temporary funding set to conclude in 2024. After three years of dedicated effort in building the PRIMECH community, it's time for the community to actively continue on its own path forward.

The event will feature presentations on the program's future directions and plans, developed together with the PRIMECH Advisory Board. There will also be fun activities and plenty of reflections on the past years we've shared. Additionally, as requested by the community, there will be networking opportunities for mechanics teachers who teach the [same subject in different faculties](#).

Agenda:

12:00 - 12:30 Community lunch

12:30 - 12:40 PRIMECH introduction: looking back and forward

12:40 - 13:30 Networking and fun activity, with coffee and sweets

13:30 - 14:00 Plans for the future, throwbacks, and the much-anticipated award ceremony

WHO:

This event is open to mechanics teachers and enthusiasts, engineers, educational experts, and **everyone who has crossed paths with us** over the past three years!

We look forward to celebrating our accomplishments and community growth with you!

Enroll

Sustainability in Mechanics Education

On Thursday, May 16th, we hosted the "Sustainability in Mechanics Education" event, which was a hit with over 20 participants! If you couldn't attend, you can find the [Collegerama recording](#) and all the presented materials on [PRIMECH's MS Teams](#).



The presentations began with a brief introduction to PRIMECH and an icebreaker where we collaboratively created an insightful word cloud focusing on sustainability. Then we gave the floor to our two guest experts of the day: **Monika Roeling** and **Daniël Peeters**.

Sustainability in Education @TUDelft



Monika Roeling introduced the [Sustainable Campus project](#) she is part of, discussing TU Delft's efforts in this area and highlighting her research on sustainable education within our university. An exciting initiative she presented, developed in collaboration with [GreenTU](#), is the [GreenDatabase](#), which is a **comprehensive list of all TU Delft courses and study programs featuring sustainability topics**. These subjects can also be filtered by Sustainable Development Goals.

Timeline

- 2019 Climate Action and research on the carbon performance of TUD
- 2020 Andy takes role from Gerrit Kalman
- 2021 Team grows with young researcher and Theme Teams collaborate
- 2021 Vision, Ambition & Action Plan published
- 2022 €100 million
- 2023 Expand core team > governance structure > LSCs
- 2023 Start EAT Lancet diet
- 2024 Bachelor pilot ABE
- 2030 CO2-neutral, climate adaptive and circular.

TU Delft



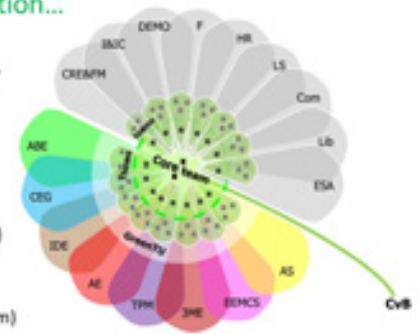
Quite an organisation...

Coordination:

- Sustainability Coordinator
- Core Team
- Theme Teams
- LSCs

All join:

- Faculties (coloured petals)
- Support (grey petals)
- Students (GreenTU)
- Executive Board (CvB, stem)



TU Delft framework – first set up

Based on engineering for one planet framework:

- Made for engineering and design education
- Cross-referenced with engineering accreditation requirements and United Nations Sustainable Development Goals
- Disciplinary competences added to the model

• Conduct research to see how this can be implemented across TU Delft

Armin Wiek: "Most important is choosing a model and start working with it"

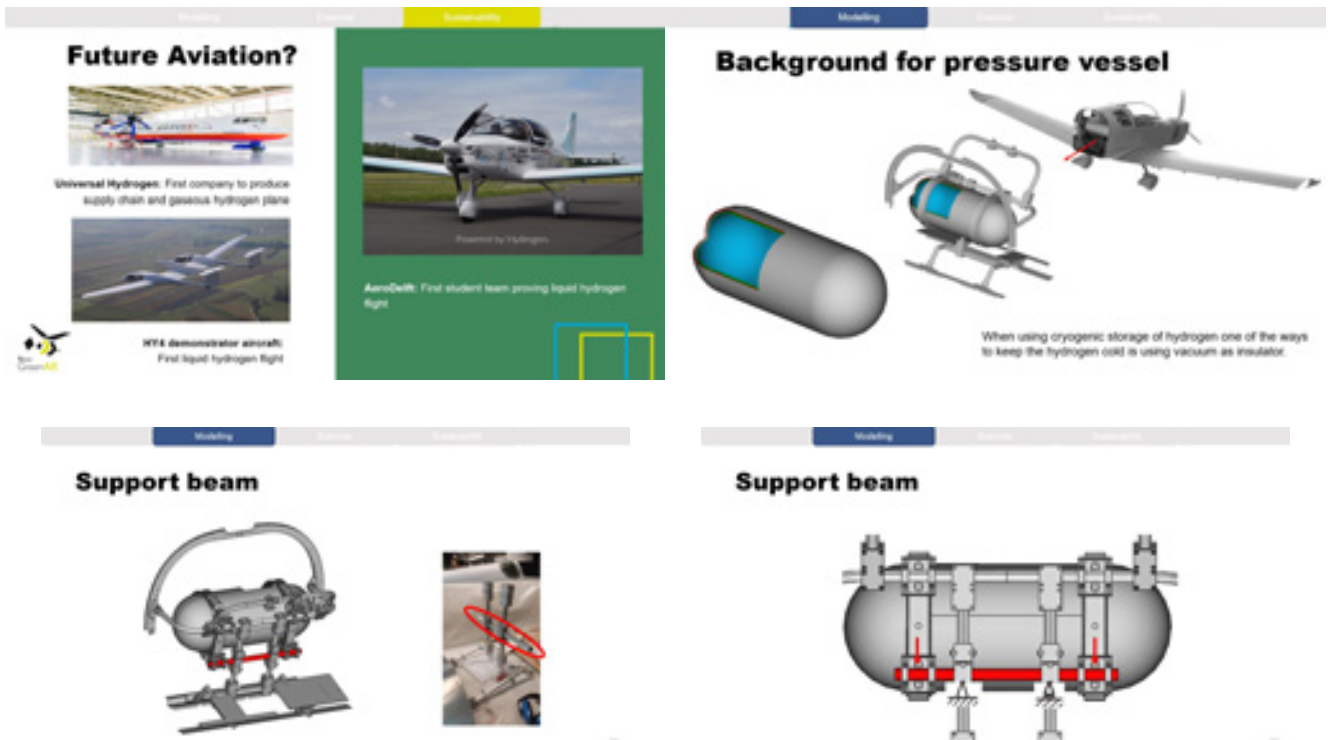


Monika and her team are **now developing a framework**, based on the Engineering for One Planet initiative (see next section), **to help teachers integrate more sustainability topics into their courses**. The framework showcases various sustainability topic areas, and we polled event participants to identify which areas align well with their courses. We also gathered insights on the support needed to implement these topics effectively. [The feedback](#) was incredibly valuable, and Monika will incorporate it into her project development.

Sustainability in Mechanics of Materials



Our second guest, Daniël Peeters, Assistant Professor in AE, presented the Accelerate project he led, which is a **practical example of how to incorporate sustainability into a Mechanics of Materials course**. This initiative also aimed to help students better connect course theory (e.g., free body diagrams, math formulas) to real-world structures.



Daniël linked all the assignments of the course together, creating a storyline based on the dream team [AeroDelft](#), using their hydrogen plane as a case study. During his presentation, Daniël showed the **interactive 3D models** of the AeroDelft structural components that he embedded in Brightspace to help the students connect the free body diagrams needed to solve the assignments to real-world structures. We shared the link to the 3D models in [Teams](#). He also worked with the **AE Green Team, who developed additional sustainability content modules** to give students a context for the assignments.

Then, Daniël discussed his process, the feedback from students, and his plans for next year. The main lesson learned is that the **sustainability content has to be closely linked to the course content for students to find it valuable**. Through this initiative, Daniël demonstrated how first-year mechanics knowledge can be applied to model real structures and design new aerospace structures with sustainability in mind. We hope more teachers will be inspired by this project to incorporate sustainability topics into their courses as well.

Once again, **thank you to the speakers and participants for your contributions to the event!**

Engineering for One Planet Framework



Are you interested in integrating sustainability topics into your engineering course but unsure where to begin? The [Engineering for One Planet](#) (EOP) Framework is designed to help you achieve this goal. This initiative emphasizes a holistic approach to engineering, considering environmental, social, and economic impacts throughout the lifecycle of engineering projects. It aims to equip future engineers with the knowledge and skills necessary to tackle global challenges such as climate change, resource depletion, and environmental degradation.

SKILLS, EXPERIENCES AND BEHAVIORS

TECHNICAL SKILLS

[Back to Table of Contents](#)



Materials Selection



Materials Selection Core Learning Outcome 6 (M.S.C.6)

Select materials for design alternatives and trade-offs that enable a long functional lifetime, have net zero greenhouse gas emissions impact, either minimal or no environmental and social harm, or are restorative to social, cultural, and environmental ecosystems ○ (2) ○

Integration Examples

-  List 5 natural materials and 5 industrial materials. Using resources in [reference 24](#) and other materials databases as needed, compare and contrast one physical property of each (e.g. yield strength).
-  Refer to the Materials Selection examples in the [EOP Framework: Quickstart Activity Guide](#).

Visit their website for a repository of resources tailored for educators, including [guidance on formulating sustainability-focused learning goals](#), [engaging learning activities](#), and key resources for each of the nine topics covered by the EOP Framework: Systems Thinking, Environmental Literacy, Responsible Business and Economy, Social Responsibility, Environmental Impact Assessment, Materials Selection, Design, Critical Thinking, and Communication and Teamwork.



MANUELA HOOGHWIERFF: *Junior Lecturer in ME*

- Who are you and what is your actual role at TU Delft?

I am Manuela and I am working as a junior lecturer at the faculty of ME for the Precision and Microsystems Engineering (PME) department. As a junior lecturer I support the full professors by taking over organisational tasks, such as finding teaching assistants (TAs) and scheduling them into different lecture halls. I am also assisting the TAs during the exercise classes for some first- and second-year mechanic courses given in the bachelor mechanical engineering, like Statics and Continuum Mechanics. Next academic year I will also be guiding the 'mentoraat' for the first-year bachelor students together with another junior lecturer. Furthermore, I am combining my work at the PME department with the master Science and Education to become a high school teacher in mathematics.

- Do you have any hobbies?

My hobbies are playing korfbal, reading, and hanging out with friends. I have played korfbal since I was a child and the last four years in Delft with the student association called 'Paal Centraal', where I also enjoyed all the fun activities and tournaments during the year. Every night before I get to sleep, I always read a bit, I am a huge fan of reading romantic series, like the seven sisters from Lucinda Riley.

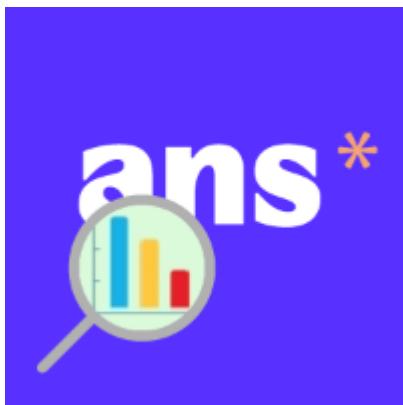
- What are your plans on Mechanics education?

Since I have a bachelor applied mathematics, I want to make a connection between the maths and mechanics education given in the bachelor of mechanical engineering. Most mechanics courses involve a lot of mathematical operations, and the professors expect students to understand and apply these operations, which may not always be the case.

- According to you, what are the advantages of being in PRIMECH?

The fact that PRIMECH has created a platform for mechanic teachers from all faculties, and the endless number of possibilities PRIMECH has to offer. So far, I have seen a lot of fun ways to improve education for different mechanics courses throughout different faculties of the TU Delft.

Monthly Mix



Accelerate work-in-progress: DiDATA

We are working with Tom van Woudenberg (CEG) on an exciting PRIMECH Accelerate project: DiData. This **first pilot project in learning analytics** involves developing a web system/**dashboard that provides additional insights into students' performance in ANS weekly quizzes** and formative assessments using the ANS API. Our long-term plans include collecting and combining data from multiple assessment tools.

Would you like to know more? Then join the **Ans Educator Day on June 12 @the Teaching Lab!** ([enroll here](#))

Do you use ANS for weekly assignments or quizzes? Would you be up for a 15-minute virtual coffee with Marta (PRIMECH project leader) to walk us through the process you follow to analyse students' performances in each assignment? **Your insights would be extremely valuable**, please drop us an email so we can arrange the call!

Memes of the month



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Newsletter

Year:2024

Month:04

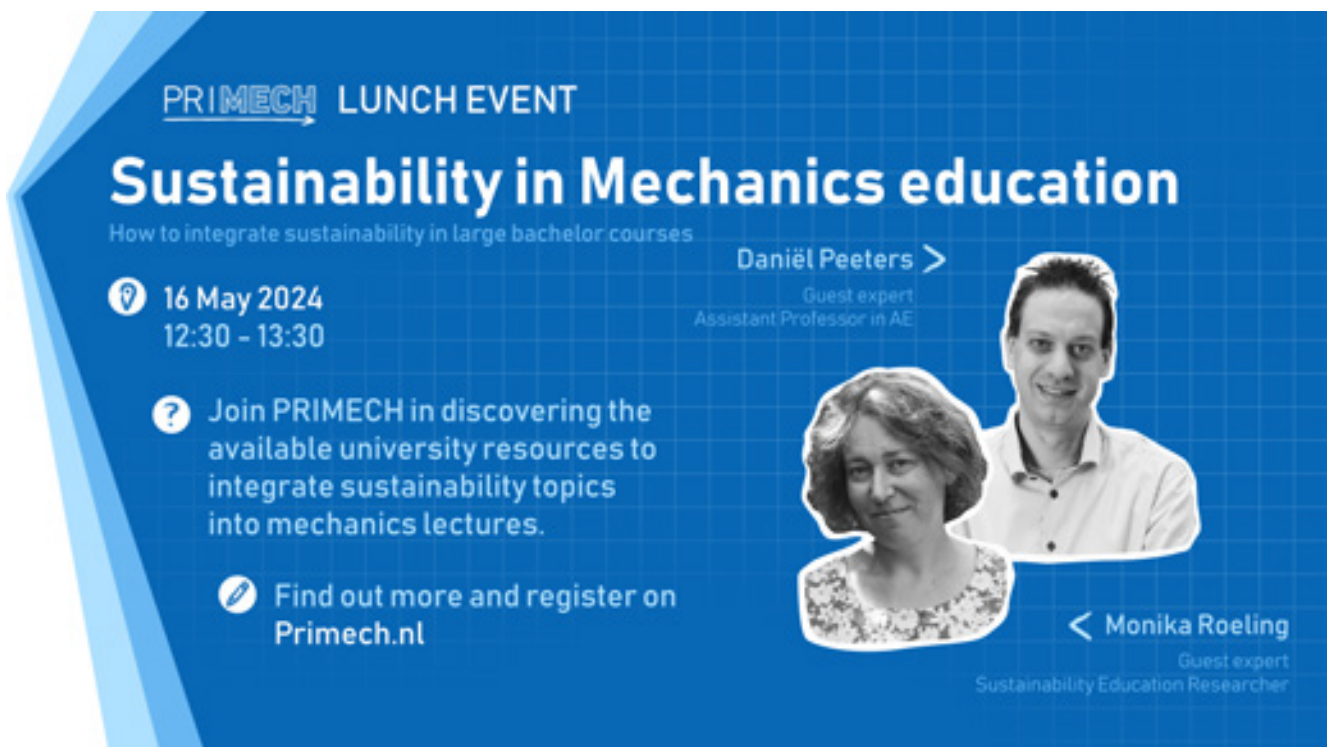
What is PRIMECH up to?

Hi there, engineers!

Are you ready for the Dutch May holiday extravaganza? Just before you leave, here's a new newsletter with exciting new events, cool education in VR, and more!

In this newsletter:

- Invitation for our next event: **Sustainability in Mechanics education**
- Last event recap: **VR, Floods and Rovers**
- Teacher in the Spotlight: **Daniël Peeters**, teacher at AE
- Monthly Mix:
 - Do you use ANS for weekly assignments or quizzes? We need you!
 - NewMedia Centre XR
 - Memes of the month



PRIMECH LUNCH EVENT

Sustainability in Mechanics education

How to integrate sustainability in large bachelor courses

16 May 2024
12:30 - 13:30

Join PRIMECH in discovering the available university resources to integrate sustainability topics into mechanics lectures.

Find out more and register on [Primech.nl](https://primech.nl)

Daniël Peeters >
Guest expert
Assistant Professor in AE

Monika Roeling <
Guest expert
Sustainability Education Researcher

Hello mechanics teachers!

For our next event, all focused on sustainability in Mechanics education, PRIMECH is happy to invite on stage Monika Roeling (TU Delft Sustainability Education Researcher) and Daniël Peeters (Assistant Professor in AE).

WHEN: 16th of May, 12.30 to 13.30

WHERE: Teaching Lab, Building 32a ▼

WHAT:

Monika Roeling (Sustainability Education Researcher): Wondering what is TU Delft doing about Education for Sustainability? Monika is a key contributor to the [TU Delft Sustainability Project](#), focusing on the Education for Sustainability theme together with GreenTU and the GreenTeams of each faculty. During her presentation, she will offer a comprehensive overview of the project's initiatives to date and its future plans in this domain to reach more sustainability in TU Delft education by 2030.

Daniël Peeters (Assistant Professor in AE): Daniel will present his sustainability-themed '[Accelerate](#)' project. Daniel teaches Mechanics of Materials in the first year of the Aerospace Engineering Bachelor program. This academic year, Daniël revised the assignments to incorporate more sustainability into his course. To achieve this, he collaborated with the dream team [Aerodelft](#), using their hydrogen plane as a case study; he worked with the [AE Green Team](#), who developed additional sustainability content modules; and with PRIMECH who helped with developing interactive visuals and slides. Daniël will provide detailed insights into the process he followed, lessons learned, and refinements he aims to implement in the next academic year.

This is a sneak peek of what his project is about:

Future Aviation?
Universal Hydrogen: First company to produce supply chain and gasous hydrogen plane
AeroDelft: First student team proving liquid hydrogen flight
MTE demonstrator aircraft: First liquid hydrogen flight

How much energy is needed to produce hydrogen?
Hydrogen turbines: 2,800 \$/GWh to produce the hydrogen = (5.2kmx0.2km) of PV panels for 2 h = 1.6 x
Hydrogen (Electrolysis): 5,411\$/GWh to produce the hydrogen = (8.6kmx0.6km) of PV panels for 2 h = 3 x

Background for pressure vessel
When using cryogenic storage of hydrogen one of the ways to keep the hydrogen cold is using vacuum as insulator.
Assumption: only thermal load, one side is at almost cryogenic temperature, other side is at room temperature. The tank does not change dimension due to thermal load. In reality this would be the case, but relieve some of the stresses.

This event is open to anyone interested in incorporating sustainability topics in fundamental engineering courses, and in meeting other TUDelft Mechanics lecturers. As always, we will provide a free lunch!

Enroll

Last event: VR, Floods & Rovers

Last Wednesday April 17th, we hosted the "VR: Floods and Rover" lunch event, and it was a huge success! We had over 30 participants. If you missed it, there is a [Collegerama recording](#) and all the presented and supporting materials can be found on [PRIMECH's MS Team](#).



The presentations began with a brief introduction to PRIMECH and an icebreaker to help participants get to know each other. Following that, we handed over the floor to our two guest experts: Alexandra and Ines. Both of them explored immersive voluntary activities to improve students' learning with the support of PRIMECH Accelerate.

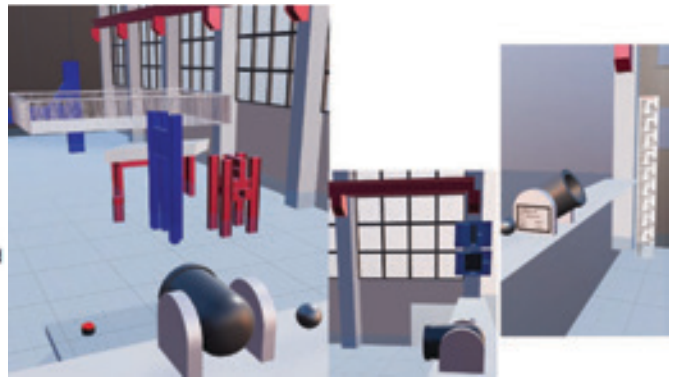
Floods: a VR "Dynamics Escape Room"



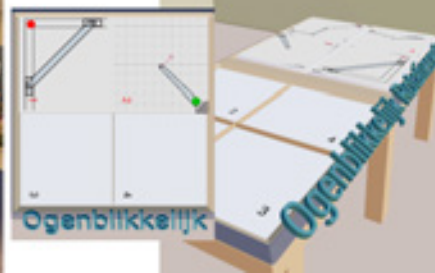
Our guest expert **Alexandra Gavrillidou (CEG)** presented her VR "**Dynamics Escape Room**". She developed this activity as formative assessment for a first-year bachelor Dynamics course. In the virtual escape room, students are tasked with the mission to prevent the flooding of the CEG building, employing their **dynamics knowledge** to do so.

Realisation steps

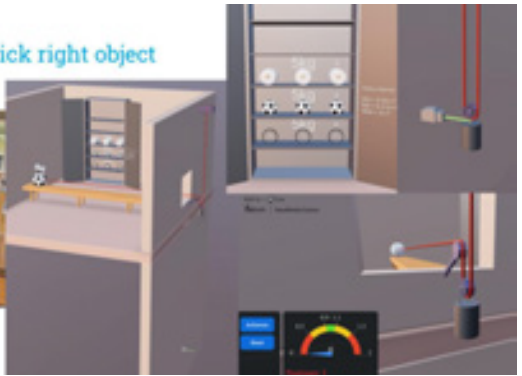
1. Funding
 - Education Innovation Projects 2023: €15k from April to December
2. Team set up
 - 3 dynamics teachers; 2 student assistants; 2 XR zone developers
3. Puzzle conceptualisation
4. Implementation VR puzzles
5. Compilation into one story line including hints, points and leaderboard
6. Roll-out
7. Evaluation



Puzzle 2: Find IC



Puzzle 3: Pick right object




Alexandra presented the realisation **steps she followed**, the gaming elements she integrated, many lessons learned, and a list of refinements she would like to do in the next activity integration.

During lunch, some participants tried to save the CEG faculty themselves as the different challenges QR codes were available to be scanned. If you missed it, contact Alexandra as she will be happy to share the QR codes with you. The same goes **if you are a dynamics teacher and would like to use her escape room activity in your course too!**

Rovers: "Mission M.A.R.I.J.N"



Our second guest, **Ines Uriol Balbin (AE)**, presented "**Mission M.A.R.I.J.N (Mars Adventures: Research Initiative for Journey & Navigation)**", a voluntary (for now!) activity for first-year AE bachelor students in the



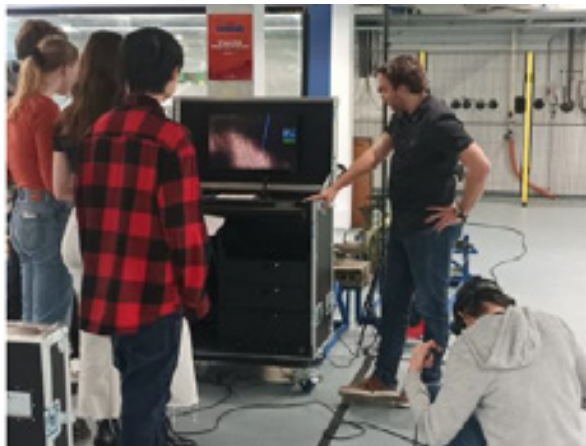
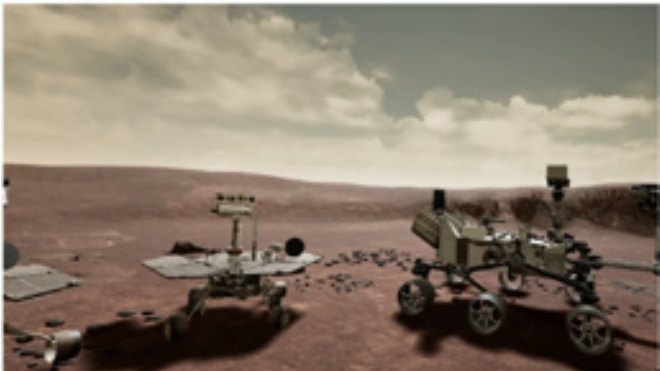

Goals of the activity

Understand better the requirements related to the environment (Mars)

Understand better the requirements related to the Rover (size, mass, etc)

Understanding of the suspension system itself

Aerospace Structures & Materials
Faculty of Aerospace Engineering



The mission consists of [three adventures](#): The Mars VR fleet (a VR environment showcasing past Mars missions), Let's Rock, Let's Bo(o)gie (hands-on experiences with driving a scale model of the Perseverance rover over rocks), and Mars Geologists on Wheels (learning more about the Martian environment, which is both the science target and an engineering challenge).

In her presentation, Ines discussed the activity development process, from the intended learning objectives to the activity specifications, to implementation and students' feedback, and shared **lessons learned for educators interested in developing similar activities**.

To hype you up in preparation for the next PRIMECH event, we're reposting this interview that we published in [last year's April issue](#):



DANIËL PEETERS:
Mechanics of Materials teacher in AE

- Who are you and what is your actual role at TU Delft?
I am Daniël, working in the faculty of Aerospace Engineering, department of Aerospace Structures and Materials. I am the responsible instructor for linear modelling, a Master course, and am involved in the course Mechanics of Materials in the first year of the Bachelor. Next to that, I do research on design and manufacturing of structures using automated fibre placement.

- Do you have any hobbies?

I like to wind down by cycling. I used to do so outside, but these days I usually cycle on an indoor training set that can simulate slopes so I can virtually cycle anywhere, and at the same time watch TV. Watching sports while doing sports does give it another dimension. ;)

- What are your plans on Mechanics education?

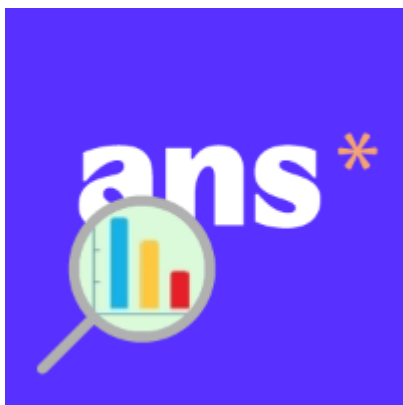
I really enjoy the blended approach we currently have, but every year there are some videos that you would like to update. And further, I keep trying to come up with problems which engage the students. This year I put a snooker table in an airplane and came up with a story-line over the 7 weeks to always have a problem related to it. With the current trend on sustainability, together with my Mechanics of Materials co-teacher Sofia Teixeira de Freitas, I am thinking about how to bring sustainability to the problems to highlight the relevance of mechanics on this crucial topic as well.

- According to you, what are the advantages of being in PRIMECH?

The free lunches and chocolate, for sure!

But on a more serious note: for me, the biggest advantage is to hear from others what they are doing and have done. There are so many ways to teach mechanics topics, and with 400-450 students in one course, I do not want to just try out something. But if you hear from others what works, it gives you extra confidence to try something new. Or you can just float an idea to get initial feedback.

Monthly Mix



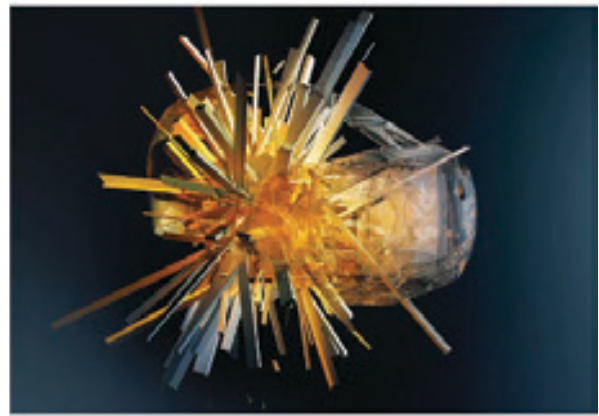
Do you use ANS for weekly quizzes? We need you!

We started an exciting new PRIMECH Accelerate project, and we need your help! Do you use ANS for weekly assignments or quizzes? **Would you be up for a 15-minute virtual coffee with Marta (PRIMECH project leader)** to walk us through the process you follow to analyse students' performances in each assignment? **Your insights would be extremely valuable for the development of a new visualisation tool.** If you are willing to participate, please drop us an email so we can arrange the call!

NewMedia Centre XR

Do you know that the TU Delft New media center has a XR team? They can assist and advise you in exploring the use of **XR (Virtual Reality, Augmented Reality and Mixed Reality technologies) in education** or research? They can develop complete solutions or just assist and advise in existing or start-up projects. Find out more here: <https://newmediacentre.tudelft.nl/xr/>.

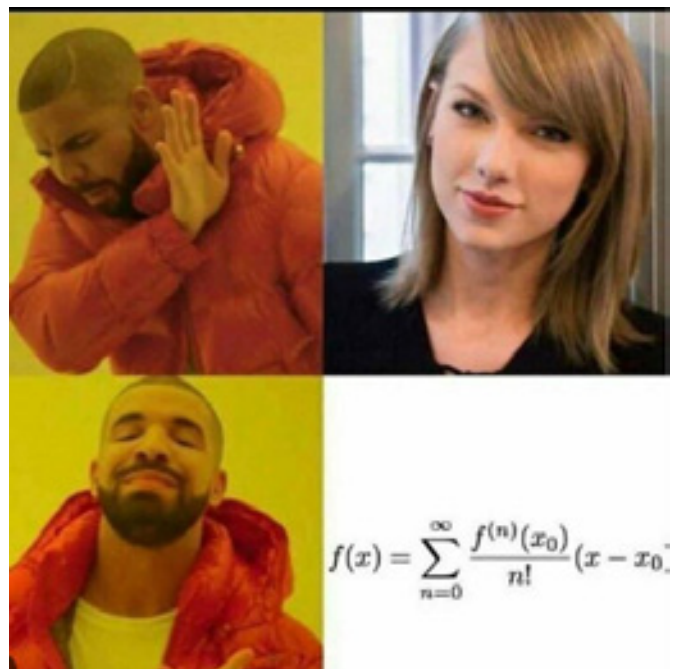
If you interested in the theme of VR in education, we also highly recommend to watch the recording on this Teaching Academy lunch event: [VR in Education- with M. Skrodzki](#)



[XR Zone website](#)

Memes of the month

A Typical Civil Engineer Commuting to Work



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Newsletter
Year:2024
Month:03

What is PRIMECH up to?

Hi there, engineers,

Easter may be over, but there is always a time for hiding and seeking Easter eggs! Which ones have you hidden for your students to find? Tell us all about it! But for now: here's a new newsletter with exciting new events, new cool technologies, and more!

In this newsletter:

- Invitation for our next event: **VR, Floods & Rovers**
- **Interactive Textbooks** and Where to Find Them
- Teacher in the Spotlight: **Alexandra Gavriilidou**, teacher at CEG
- Monthly Mix:
 - Getting some ANSwers
 - Meeting and eating with Just Herder
 - Can you spot the Accelerate poster?
 - Memes of the month

PRIMECH LUNCH EVENT

VR, Floods & Rovers: exploring mechanics outside the classroom

📍 17 April 2024
12:30 - 13:30

❓ This month, PRIMECH presents immersive voluntary activities for bachelor students. Join us to explore innovative mechanics projects with two lecturers.

🔗 Find out more and register on [Primech.nl](https://primech.nl)

>
Ines
Uriol Balbin
Guest expert



<
Alexandra
Gavriilidou
Guest expert



Hello mechanics teachers!

For our next event, PRIMECH is happy to invite on stage two members of the community: Alexandra Gavriilidou (CEG teacher) and Ines Uriol Balbin (AE teacher).

WHEN: 17th of April, 12.30 to 13.30

WHERE: Teaching Lab, Building 32a ▾

WHAT: Both Alexandra and Ines explored immersive voluntary activities to improve students' learning with the support of PRIMECH Accelerate (more about Accelerate in the rest of the newsletter).

Alexandra Gavriilidou (CEG lecturer): Alexandra will present the **"VR Dynamics Escape Room"** she developed as formative assessment for the Y1Q2 Dynamics course she teaches. In the virtual escape room, students are tasked with the mission to prevent the flooding of the CEG building, employing their dynamics knowledge to do so. Would you like to develop a similar activity for your course? Make sure to attend her presentation, as Alexandra will discuss the process she went through to develop this activity in detail, along with all the lessons learned. Moreover, during lunch, we will demo the activity so you can try saving the CEG faculty yourself!

Ines Uriol Balbin (AE lecturer): Ines will present **"Mission M.A.R.I.J.N"** (Mars Adventures: Research Initiative for Journey & Navigation), a preparatory activity for first-year bachelor students in the course 'design and construction', which immerse students in the fascinating world of Martian exploration while introducing the concept of 'design requirements'. The mission consists of three adventures, from a VR environment showcasing past Mars missions to hands-on experiences with driving a scale model of the Perseverance rover and with analysing terrestrial analogues of Martian rocks. Ines will focus on the activity development process and share learned lessons for educators interested in developing similar activities.

This event is open to anyone interested in innovative mechanics activities in engineering education and meeting other lecturers in the sector. As always, we will provide a free lunch!

Enroll

Interactive textbooks (and where to find them)




Have you heard of the Interactive Open Textbooks initiative? If not, you're in for a treat!

While academic literature such as papers and textbooks are foundational to our university education, they often lack interactivity, both for students and teachers seeking to utilize these resources optimally. The **Interactive Open Textbooks initiative (OIT)** aims at providing support for TU Delft teaching staff interested in publishing their educational resources as open*, interactive textbooks.


So, what exactly are interactive textbooks? Rather than just telling you, we'd love to show you! **Explore the catalogue of openly published books [here](#).**

Utilizing **Jupyter Books**, the initiative empowers authors to create textbooks with interactive elements, making learning engaging and accessible. Authors can write content in markdown format or convert directly from LaTeX or Word. With the source hosted on platforms like GitHub or GitLab, collaboration and version control become seamless, facilitating easy additions and improvements to textbooks.

See some testimonials of students here below!



Anonymous MSc Applied Earth Sciences Student “
MUDE Book
I find it very helpful during the FEM week, the provided wigglets of shape function really helped me understand it



Anonymous MSc Environmental Engineering Student “
MUDE Book
It is much easier to browse through an online textbook instead of having to search through a normal textbook, the latter takes way more time.

Feeling inspired? The OIT initiative organizes information and training sessions, plus they manage the [community of authors](#) in MS Teams for ongoing support and collaboration. Additionally, **a group of passionate educators from the CEG faculty has launched [Teachbooks](#)**, a sharing and collaborating platform that also offers a toolkit for TU Delft teachers with minimal coding experience, making the development of interactive textbooks even more accessible. We are looking forward to interact with your mechanics masterpieces!

*The OIT initiative is part of TU Delft Open Publishing (<https://textbooks.open.tudelft.nl/textbooks/information/info-textbooks>), which is a core component of the TU Delft strategy and vision for open education. You can find out more about it and about the open education week here: <https://www.tudelft.nl/teachingacademy/themes/open-education>



ALEXANDRA GAVRIILIDOU: Teacher at CEG

- Who are you and what is your actual role at TU Delft?

I am Alexandra, and I am working as a lecturer in the Transport and Planning department of Civil Engineering. I am teaching in the bachelor and in the master, on topics ranging from dynamics of particles and rigid bodies to data collection and modelling of cyclist behaviour.

- Do you have any hobbies?

I like playing board games, especially cooperative ones so the win or the loss can be shared. Escape rooms are the most fun for me. I also enjoy being in nature and going for long walks with friends.

- What are your plans for Mechanics education?

My vision for education in general is that it should be fun as students are then more likely to engage with the material and learn. As Dynamics is perceived by bachelor students to be a very difficult course, I am exploring ways to introduce a fun element in the course. Setting up an escape room as a formative education activity is the start of implementing this!

- According to you, what are the advantages of being in PRIMECH?

PRIMECH has helped create a community that goes beyond my own faculty and allows me to meet and interact with colleagues that teach mechanics in other faculties. This common ground gives the opportunity to share experiences and challenges concerning similar topics, but also to think together on how to overcome them.

Monthly Mix



Getting some ANSwers

This week, we have kicked off a new PRIMECH Accelerate project with CEG teacher Tom van Woudenberg!

Inspired by his creative use of the ANS API, we will create an analytics tool that will make it easier for teachers to get a comprehensive overview on how students are performing on their ANS assignments/exercises/questions.

Do you use ANS and are you interested in such a tool? [Contact Marta for a 15 min virtual coffee](#) so we can use your input for the tool as well!

Meeting and eating with Just Herder

On April 23rd, at the Teaching Lab, there will be a **Meet and Eat lunch chat with Professor Just Herder**, a longstanding member of the PRIMECH community. Just isn't just a Professor in Interactive Mechanisms and Mechatronics; he also teaches Statics to first-year bachelor students in ME and last summer, he received the well-deserved title "Professor of Excellence / Leermeester2023." This award acknowledges his contributions to both research and teaching.

All the details of the events and the enrolment link can be found [here](#). Additionally, the Teaching Academy has set up a [webpage](#) to "Get inspired by Prof Just Herder". If you haven't already, don't miss the opportunity to watch the speech Just gave at the official award ceremony [here](#), starting at the 38th minute. In his presentation, Just tells the story of his academic journey and the evolution of his passion for Mechanics, making it an incredibly inspiring experience.





Did you spot Accelerate at your faculty yet?

Different Accelerate projects are reaching their conclusion. So we have been hanging up posters throughout the university to invite a new round of enthusiastic mechanics teachers to start an Accelerate project with us!

Did you spot one of them yet and do you have a good idea to innovate mechanics teaching? Fill in the [intake form](#) and have a brainstorming session with the PRIMECH team!

You don't know what accelerate is? Find out more on our [webpage](#).

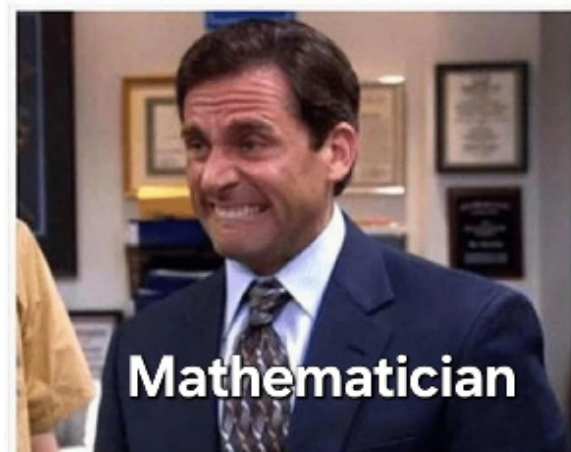
Memes of the month

Bringing back our spring classic:



ENGINEERING APPROXIMATIONS:

when $\sin \theta = \theta$:



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Newsletter
Year:2024
Month:02

What is PRIMECH up to?



Hi there, engineers

It's March, and occasionally the sun is shining! Did you try petting the baby geese at the Mekelpark yet? Meanwhile while you contemplate all the possible ways that this could go wrong: here is the newest PRIMECH newsletter for you, filled as usual with tips, insights, pictures and most important of all: fresh memes.

In this newsletter:

- Insights and pictures from our last event: **From Math to Mechanics 2**
- Accelerate presents: **Mission M.A.R.I.J.N.**
- Teacher in the spotlight: **Ines Uriol Balbin**
- Monthly Mix:
 - Math and mechanics join forces at AE
 - Mars Rover drives over master students
 - Memes of the month

Last event: From Math to Mechanics 2

Last Thursday the 'From Math to Mechanics 2' event took place, which could be attended without the need to see the first one. But for those who did not see the first event, here a brief recap: students in mechanics courses struggle to use the math topics previously studied, there is a 'missing link'. Students should be helped by explicitly connecting the math and mechanics topics. Collaboration and sharing of materials between math and mechanics teachers are key aspects to reach this goal. One giant step forward is the PRIME Catalogue.

The PRIME Catalogue

Beryl van Gelderen, PRIME coordinator and our event guest expert, presented the new [PRIME Catalogue](#). This is a curated collection of PRIME's best teaching materials (videos, visualizations, MOOCs,...) developed so far. The current total stands on 190(!) educational resources. But wait there is more; it is searchable with keywords! We believe this could be very handy for mechanics teachers who need students to refresh some math topics needed in their mechanics course. Of course students can also fuel their own interest and look at any topic that is of interest to them.

As PRIME is always looking to bring more real life examples to their math instructions, they would be happy to work with any mechanics teachers who wants to suggest or develop new content. So if you have a suggestion to add or develop new content to the 190 already available educational material, you can [contact](#) Beryl.

Mastering Mathematics MOOC

At the end of the presentations, Vincent Wassenaar gave a quick pitch about a new MOOC: [Mastering Mathematics for Engineers](#), which can be used by master students to refresh specific math topics and meet

different math requirements for master- or third-year bachelor- courses. If you have used, or are planning to use the MOOC, send any feedback or suggestions you have to Vincent.

The current state of both initiatives is already highly valuable. There is only one thing that is currently missing, which is that not all teachers know about the catalogue or MOOC. And that is where you come in. Spread the word!

You can find the event pictures [here](#). In case you missed it, you can find the lunch event Collegerama recording [here](#), and [here](#) is the collection of all the presented slides.



“Mission M.A.R.I.J.N.” completed!

Mission M.A.R.I.J.N. (Mars Adventures: Research Initiative for Journey & Navigation), developed in collaboration with Ines Uriol Balbin, lecturer in Aerospace Engineering, is finally completed! Together, we've created an engaging instructional activity for first-year bachelor students in the course 'design and construction'. Our mission? To immerse students in the fascinating world of Martian exploration while fostering their understanding of the concept of 'design requirements'.

The M.A.R.I.J.N. mission consists of 3 adventures: *The VR Mars Fleet*, where students get to know more about past Mars missions in a VR environment; *Let's Rock, Let's Bo(o)gie*, where students gain insights into the functioning of rovers' rocker-bogie mechanism by driving M.A.R.C.O. (a 1:4 scale replica of the Perseverance rover); and *Mars Geologists on Wheels*, where students discover how the Martian terrain influences rover design.

PRIMECH contributed to the development of the instructional activity, by helping defining learning objectives and activities specifications, and we developed a beautiful activity sheet and mission badge, while the physical learning

materials and tools had been previously developed or collected and generously made available by several AE staff members.

During the first week of Q3, the Mars adventures unfolded as 70 students, divided into 5 groups, completed the mission! Stay tuned as Ines has promised to share more about this project during the next PRIMECH event!



INES URIOL BALBIN: Structural Mechanics teacher at AE

- *Who are you and what is your actual role at TU Delft?*

I'm Ines, and I am part of the Aerospace Structures and Materials group as a lecturer. My focus lies in space structures and mechanisms as I am also the coordinator of the Structures for Space master profile.

- *Do you have any hobbies?*

I like singing and bouldering. I am also fascinated with history in general and the history of Delft in particular.

- *What are your plans for Mechanics education?*

I want to introduce more hands-on experience. I believe it is a very fun and rewarding way to teach, even if it is a logistical nightmare at times.

- According to you, what are the advantages of being in PRIMECH?

It's a great chance to meet other educators who are enthusiastic about improving their methods of instruction and sharing innovative ideas. I also like that it has introduced me to resources I would have not known otherwise.

Monthly Mix

Math and Mechanics join forces at AE

PRIMECH (project owner: Marta Gavioli) and PRIME (project owner: Daniela Petrova) are leading a collaboration project between the math and mech teachers of the first two years of bachelor in Aerospace Engineering. The project aims to align mech and math courses by introducing concepts at the right time and in the right sequence and to use each other's examples and materials for reinforcement and efficiency.

Major outcomes so far include a map of the math topics needed in each mechanics course. We believe this can be very useful for students to know what topics they need to refresh before the course start. Also we will share the map with the Aerospace bachelor program renewal team.

If you wish to know more or start something similar in your own faculty, do not hesitate to contact them.



Mars rover drives over master students

Curious to know more about M.A.R.C.O, the 1:4 scale replica of the Perseverance rover used in the MARIJN mission?

Before implementing the activity in the course, it has been tested with some enthusiastic master students from Team Tumbleweed

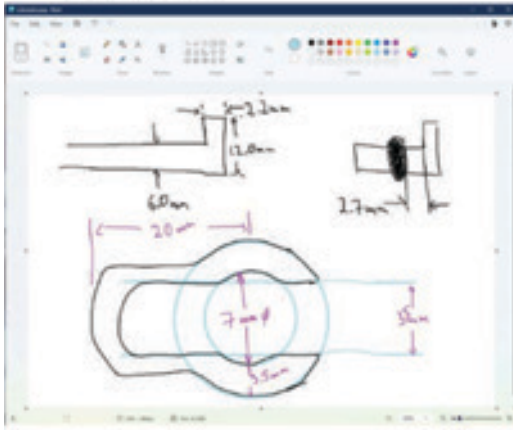
(<https://www.teamtumbleweed.eu/>). One of them developed this entertaining video, topped off with an "exclusive interview" featuring PRIMECH project leader, Marta

Meme of the month

Me: Mom, can we have CAD?

Mom: No, we have CAD at home.

CAD at home:



Winner of snow plow naming contest in Hamilton.



Low voltage: "I always take the path of least resistance and I cannot pass through anything unless it is a conductor. Disconnect me and I won't be able to go anywhere"

High voltage: "WHERE'S THE FUCKING WIRE?!!!"



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Newsletter
Year:2024
Month:01

What is PRIMECH up to?

Hi there, engineers

Happy New Year!* The new years resolutions of PRIMECH are: keep bringing our wonderful mechanics community together and helping them innovate mechanics education.

What are yours?

In this newsletter:

- Invitation for our next event: **From Math to Mechanics 2**
- Insights and pictures from our last event on **Mechanics Exams**
- Accelerate presents: **Dynamics Escape Room**
- Monthly Mix:
 - Cool Things You Can Find on the Teaching Support Website
 - Meme of the month: Mechanics exam edition

* The PRIMECH Team is aware of the Driekoningen regel and has decided to ignore it.



PRIMECH LUNCH EVENT

From Math to Mechanics 2

Refreshing Math in Mechanics Courses

28 February 2024
12:30 - 13:30

Beryl van Gelderen >
Guest expert
PRIME coordinator

Join PRIMECH in a session through PRIME's math teaching materials and the new "PRIME Catalogue," to refresh math concepts in mechanics courses.

Find out more and register on [Primech.nl](https://primech.nl)

Hello Mechanics teachers!

Exciting news: the second "From Math to Mechanics" event in partnership with PRIME is here!

Join Beryl van Gelderen, one of PRIME's coordinators, as she guides us through PRIME's high-quality math teaching materials, now easily accessible with the "PRIME Catalogue." Refreshing students' knowledge of math concepts in your Mechanics course has never been so easy!

"From Math to Mechanics" is a series of sessions to strengthen the connection between Math and Mechanics education at TU Delft. Marta Gavioli (PRIMECH project leader) will take this chance to give a short community minutes talk about the ongoing Math + Mech collaboration project in the Bachelor programme of Aerospace engineering, with the hope of inspiring this type of collaboration in other faculties too.

This event is open to anyone interested in improving the connection between mathematics and mechanics in engineering education (mechanics and mathematics teachers, teaching assistants, learning developers, directors of studies, and more). As always, we will provide free lunch!

WHEN: 28th of February, 12.30 to 13.30

WHERE: Teaching Lab, Building 32a [v](#)

Please, enroll using the button below, so there will be food for everyone. Once enrolled, you will receive an Outlook calendar invitation.

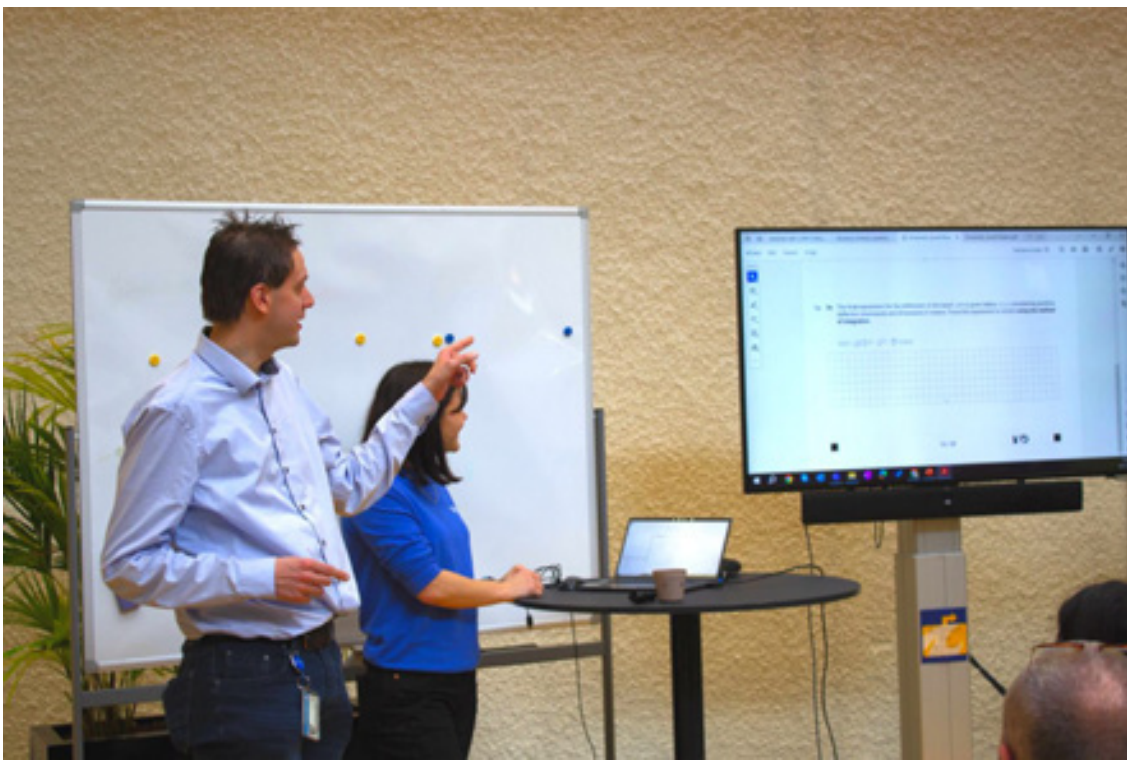
Enroll

Last event: Exam Show and Tell

What makes a good exam question? Developing mechanics summative assessments is a big task. Our aim with this event was for teachers to informally discuss best practices, learned lessons and to inspire each others. During the event, everyone could share their take on a what makes an exam question good, how they usually structure their exams, what assessment tool they use and how / if to keep exams questions "secret" after the exam.

Exams being clear and doable for students seemed the main challenge in developing questions. As quoted by one of the mechanics teachers: "you should not do what I say, but do what I mean". Three teachers showed a question from their exams and explained how the students understood it: what worked, and what not. At the end, there was room for a group discussion.

Interested to know more? Find all the presented material and polling results in our MS Team [here!](#)



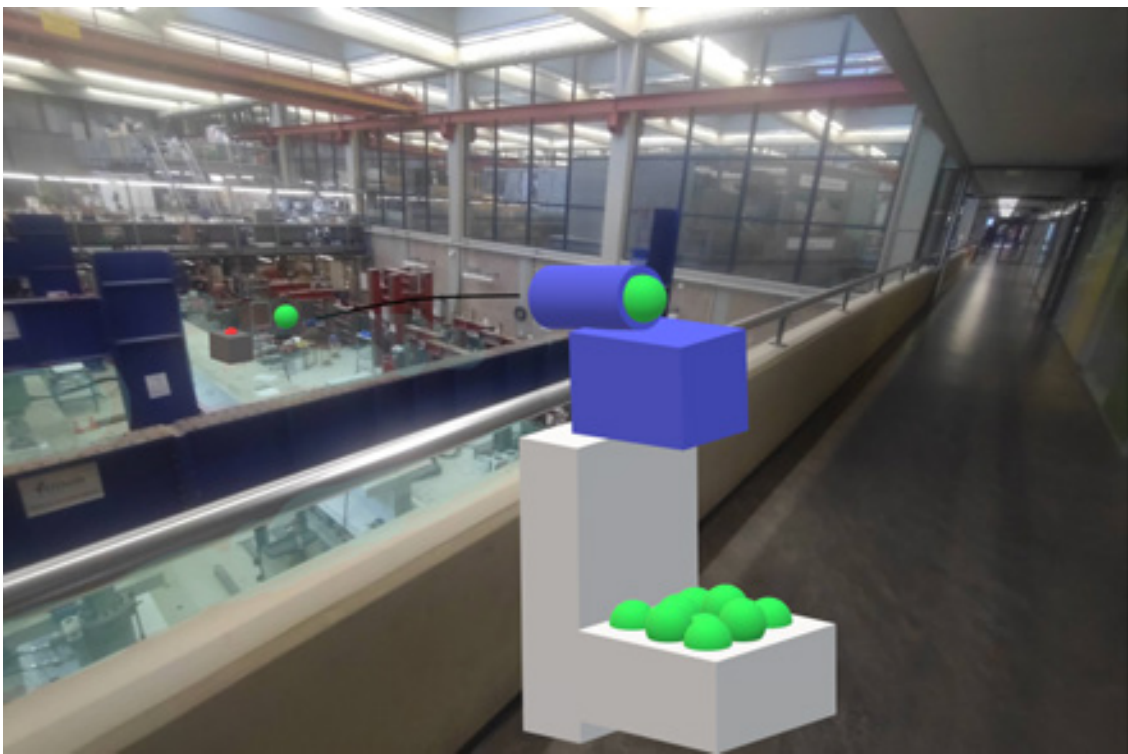
Accelerate presents

Dynamics Escape Room: Pilot done!

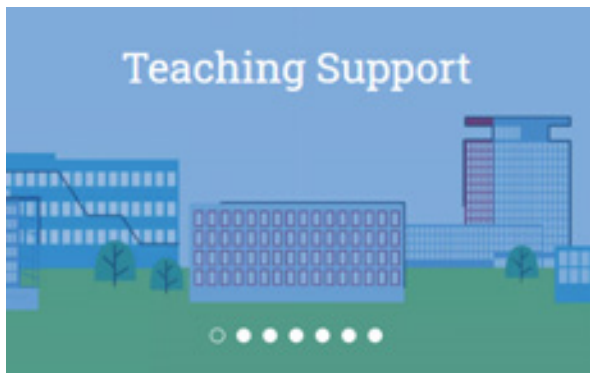
In March of last year, we started collaborating with Alexandra Gavriilidou (CEG) on her project to develop an augmented reality escape room as a formative assessment for the Y1Q2 Dynamics course she teaches.

Alexandra's escape room concept, both straightforward and impactful, tasked students with a mission to prevent the flooding of the CEG building, employing their dynamics knowledge to do so. PRIMECH provided support in the development of the puzzles; while the VR zone developed the AR interface.

The AR escape room was successfully piloted in December, just before the winter holidays, and more than 20 student teams voluntarily took part in the activity. Alexandra is already brainstorming ideas to enhance the activity for the upcoming academic year, and she has promised to present the process she went through and the learnt lessons during the PRIMECH lunch event in April. We are all so looking forward to know more!



Monthly Mix

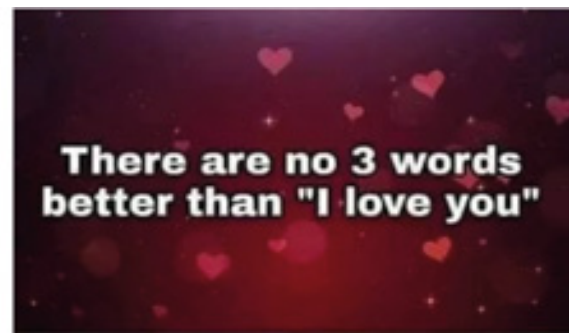
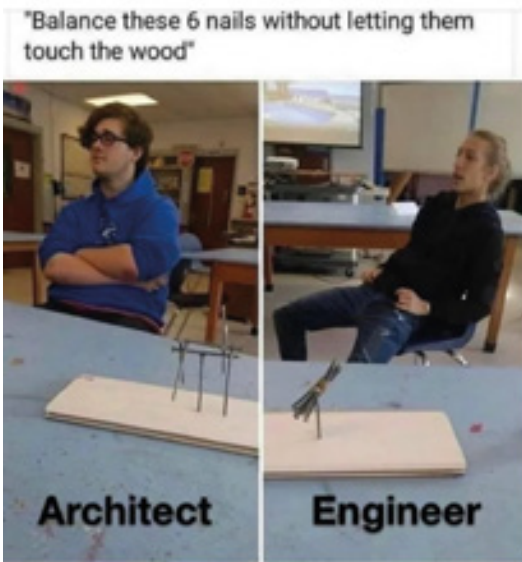


Another shout-out to the TU Delft teaching support website

As PRIMECH, we would like to give another shout-out to the TU Delft [teaching support website](#) as we believe it is not getting the attention it deserves.

There, you can find overviews of the [available educational tools](#) (we discovered [Vevox](#) and now we are addicted), teacher training material (for example, we studied in depth the "[assess](#)" section in preparation of the last PRIMECH event and it was great) and much more!

Meme of the month: Mechanics exam edition)



"Assume ideal gas"
 "Assume Incompressible flow"
 "Friction is negligible"
 "Steady state operation"

Students before the exam -->



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Newsletter
Year:2023
Month:12

What is PRIMECH up to?

Hi there, engineers

Christmas is almost there! Good luck with finishing all the projects and deadlines that need to be finished before the holidays. We wish you a well deserved rest afterwards. In the meantime: here's a christmassy PRIMECH newsletter to cheer you up! (it includes very good christmas memes)

In this newsletter:

- **Christmas greetings** from the PRIMECH Team
- Invitation for our next event: **Mechanics exam questions**
- Insights and pictures from our last event on **Digital Assessment**
- In the spotlight: our new team member: **Fay Wolf**
- Monthly Mix:
 - PRIMECH Events video
 - Christmas presents
 - Meme of the month: Christmas edition



Mechanics exam questions

Show and tell: peeking is allowed!



- 📍 18 January 2024
12:30 - 13:30
- ❓ Do you have an exam question you wrote that you are quite proud of? Join our next event! We will have a look together at what makes an exam question a good one.
- 📝 Find out more and register on [Primech.nl](https://primech.nl)

Hello mechanics teachers! Do you have an exam question you wrote that you are quite proud of? Do you have an exam question with a story worth telling? Are you curious to know what exam questions your colleagues are using?

Join PRIMECH in our next event about summative assessment! We will have a look together at what makes an exam question a good question and we will start creating a library of good questions together. Moreover, this event offers an excellent opportunity for you to connect with other mechanics teachers from across TU Delft and learn about their teaching style. And, as always, we will provide free lunch!

WHEN: 18th of January, 12.30 to 13.30

WHERE: Teaching Lab, Building 32a [v](#)

Please, enroll using the button below, so there will be food for everyone. Once enrolled, you will receive an Outlook calendar invitation.

Enroll

Our latest event: Digital Assessment Tools

As PRIMECH we believe in building a community and what brings a community closer together than chocolate! As people registered for the event we handed out delicious custom-made chocolate bars in two different flavours. Next year PRIMECH will continue to host events but do you know when they are? Now you never have to forget again because all events are marked in the newly printed calendar for '24/'25!

Community minutes

Marta gave a brief introduction of PRIMECH for the people who were there for the first time. She announced the winners of last year puzzles that were present in the Calendar of '23/'24: Domas and Renee. They were delighted to receive their very own PRIMECH cup.

Tom presented his implementation of ANS, as a formative assessment tool. He developed it together with PRIMECH's initiative Accelerate. He has reached quite a lot of students (in Dutch we would say that the 'numbers did not lie about it') and they received it positively.

Schoolyear

Dennis showed the implementation of the 'tool' of Schoolyear. He showed what it is and what it isn't (see picture below). It is promising in the scaling of students taking online exams, as you are no longer bounded by the amount of pc's available on the university.

Schoolyear is ...

definitely:

- a good solution**
- fraud-prevention browser**
- easy to use**
- usable with any webpage**
- suited for laptops and PCs**

definitely not:

- the holy grail**
- proctoring software**
- fool proof**
- integrated in every webpage**
- compatible with every OS**

Later in the afternoon, Dennis conducted a comprehensive Schoolyear hands-on workshop demonstrating how to use this tool, from both the teacher and student perspectives. [Here](#) is the workshop manual. If you are interested in using the tool but couldn't make it to the workshop, please contact Dennis; he is more than willing to assist.



In the spotlight: *A new member of the PRIMECH Core team*



Hi there! I am the new graphic designer at PRIMECH. I'll be making designs, as well as managing the LinkedIn page, and helping where else is needed. I hope to contribute to involving as many teachers to the community, to be able to innovate together :)

Last year, I was secretary of the board of ID study association (of the faculty Industrial Design Engineering). Last September I started my master Strategic Product Design. This means I will probably not understand all mechanics memes, haha.

In my free time I like playing tennis and going for a walk or run. I have picked up playing the guitar again, and like to be creative: drawing, making pictures, making collages, etc. That is it about me for now, I hope to see you around at the Teaching Lab!

Monthly Mix



PRIMECH Events video

Do you want to relive the amazing energy of our PRIMECH events? Or are you curious about what our events are like? Watch the video below about PRIMECH's events and workshops and get a taste of the atmosphere!

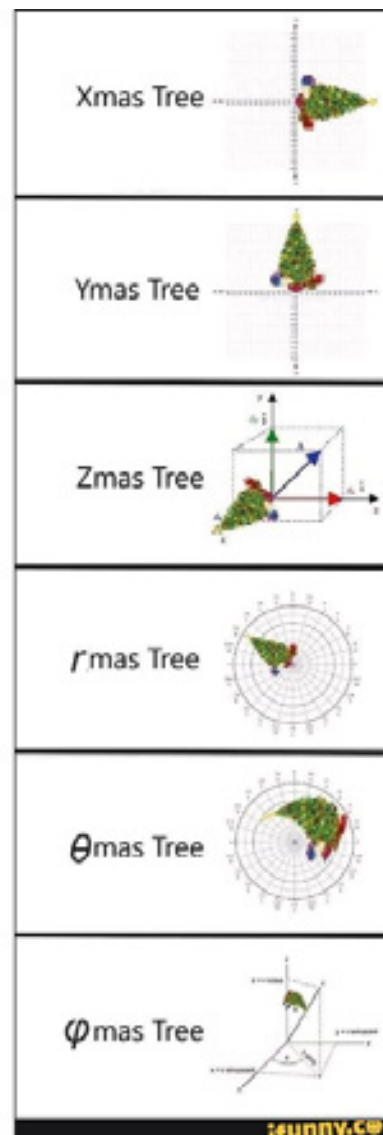
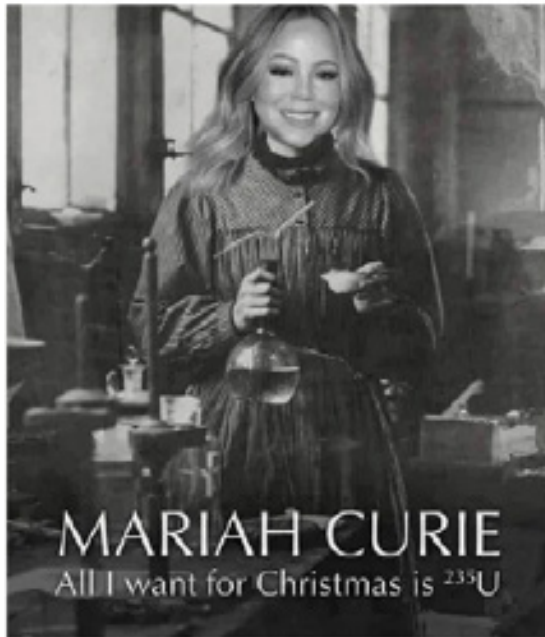
PS. Credits to Veronica for making the wonderful animations in the video. Do you want to develop such videos for your own course? Contact us, and we can help you with that through PRIMECH Accelerate.

Christmas presents

It is almost Christmas again, so naturally, the PRIMECH team has made gifts. Didn't get yours at the last event yet? Come by or go to our next event on January 18 to get one yourself! Gotta collect them all!



Meme of the month: Christmas edition



PRIMECH stands for **PR**ogramme of Innovation in **MECHANICS** education. It is an interfaculty project started at TUDelft the 1st of October 2021. It has been initiated by the Student Council and supported by Education & Students Affairs. Our focus is on innovating **Bachelor level Mechanics courses**.

Currently, the **PRIMECH team members** are **Marta Gavioli**, project leader; **Veronica Comin**, workshop designer; **Marijn Roelvink**, software developer; **Thijs Hoedemakers**, meme acquirer; **Fay Wolf**, graphic designer and **Hans Hellendoorn**; project supervisor.

You are receiving this newsletter because you have crossed paths with us in the last months.
We hope you enjoy staying informed about our progress!

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Marta Gavioli m.gavioli@tudelft.nl

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You can [update your preferences](#) or [unsubscribe](#)



Newsletter
Year:2023
Month:11

What is PRIMECH up to?

Hi there, engineers!

It is raining every day and getting cold and dark in the Netherlands. But no stress, here is the newsletter of PRIMECH to share some warmth, nice updates and fun events!

In this newsletter:

- Invitation for our next events: **Digital assessment tools**
- Insights and pictures from our last **Community Event**
- In the spotlight: the new **Advisory Board**
- TheEngEdu Research Corner: **Effectiveness of Instructional laboratory activities**
- Monthly Mix:
 - PRIME Applets
 - Education day
 - AE Mech + Math meeting
 - Meme of the month



PRIMECH EVENTS
Digital Assessment Tools

13 December 2023
12:30 - 13:30 lunch event
14:00 - 16:00 hands-on workshop

Struggling with assessment for large cohorts of students? Join PRIMECH for our next lunch event and afternoon workshop, all focused on digital assessment!

Tom van Woudenberg
Community minutes

Dennis den Ouden-van der Horst
Guest expert and workshop moderator

The PRIMECH team is happy to invite you to our next event, about digital assessment tools. This is the last time we will meet before winter holidays and for this reason we might have some presents for you (yet, it could be **chocolate** this time!).

Lunch event

"Struggling with assessment for large cohorts of students? Join PRIMECH for our next lunch event, all focused on digital assessment!

First, Tom van Woudenberg, mechanics teacher in CEG, will share a brief community minute, updating us on his experience with [ANS](#) and formative assessment in a first-year, first-quarter Statics course. He'll share best-practices on self-grading and immediate feedback. If you missed his initial presentation last year, you can find the recording [here](#).

Following that, our guest expert Dennis den Ouden-vander Horst, a [PRIME](#) math teacher, will present his explorations with a new tool called [Schoolyear](#), which enables students to take exams in a controlled environment on their own devices or on university computers. Dennis will provide an overview of the tool, its advantages, and positive impacts on assessment, along with its potential integration with various digital assessment tools. The session will include an extensive Q&A.

WHEN: 13th of December, 12.30 to 13.30

WHERE: Teaching Lab, Building 32a [v](#)

Please, enroll, so there will be food for everyone. Once enrolled, you will receive an Outlook calendar invitation.

Enroll for lunch event

Workshop

Are you excited to try out Schoolyear yourself? Join the hands-on workshop after the lunch lecture! During the workshop, Dennis will guide you through the process of setting up Schoolyear on your own device and running assessment (Grasple assessment will be used as example). Step by step, you will learn how Schoolyear works from both the teacher's and the students' perspectives.

The workshop is open to anyone interested in this tool. Participants will have the opportunity to explore the capabilities of Schoolyear for their courses, exchange ideas with colleagues regarding its potential applications for digital assessment, and collectively brainstorm the next steps and requirements for effective implementation in TU Delft.

WHEN: 13th of December, 12.30 to 13.30

WHERE: Teaching Lab, Building 32a [v](#)

Enrol using the button below. Please note: max 20 participants, enrolment deadline 8-12-2023. We need you to enrol in order to add you to the Grasple environment. If you enrol, please remember to bring your own laptop and make sure you have admin rights!

Enroll for workshop

Insights from the community event

On October 23rd, we kicked off the academic year 23'/24' with our PRIMECH community! There was an abundant exchange of plans and ideas. We started the event by presenting our own plans for the coming year: you can

expect more newsletters, community events and PRIMECH Accelerate projects! We have also installed an advisory board to think about the plans for PRIMECH after AY 23'/24'

Accelerate projects

Following on our introduction, **Daniël Peeters** and **Ines Uriol Balbin** updated us on the current status of their PRIMECH Accelerate projects. For the assignments of his Mechanics of Material course, Daniël is using 3D models of the structural components of a hydrogen plane to link the exercises to each other, to real-world mechanics and to several sustainability topics.

Ines is developing a voluntary activity for Year 1 aerospace students. The activity involves a VR parking environment featuring six different Mars rovers, a remote-controlled 1:4 scale replica of the Perseverance rover, and a mission booklet designed to guide the students through the fun experience. We are looking forward to share more details about this projects in future lunch events!

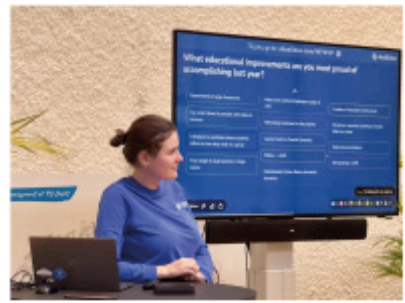
Mechanics teachers are doing cool things

We then asked the participants through Ahaslides what educational improvements they were most proud of accomplishing last year. It was amazing to see how many educational innovations have been done in the past years! One teacher has created a workshop where students reflect on how they work in a group, someone else has developed a distributable Python library for structural dynamics, a third person implemented self-grading in ANS and one person even created a practical about putting a snooker table on a plane!

Aside from looking back to our past accomplishments, we have also looked forward together. The answers ranged from teaching dynamics for the first time (good luck!!) to answering the more philosophical question on what students should learn to get a passing grade. We hope that PRIMECH's event has brought inspiration on solving the challenges ahead.

As an outlook on the coming year, we were curious as to what you are looking for when attending our events. With the majority of votes, the people said that they searched for alignment with other faculty practices. The top 2 and top 3 reasons were 'inspiration' and 'examples of application of mechanics in practice'. We will take this feedback with us and hope to provide these in the coming year!

Do you want to know what other interesting answers were presented during the event? You can find the full outcome of the polls [here!](#)



In the spotlight:

The new Advisory Board

PRIMECH has an advisory board. That sounds amazing but who are they and what will they be doing?

Who is in it?

The advisory board consists of 8 members with a variety of backgrounds. In our first meeting we have discussed the expectations, backgrounds and #2 of each other's bucket list.

What will the advisory board be doing?

These people have been tasked to have a look at the current state of PRIMECH and determine what it going to look like after august '24. After august '24 the finances in their current form will stop, as well as the project lead.



TheEngEdu Research Corner:

Effectiveness of Instructional laboratory activities

Welcome to the EngEduResearch Corner, where we provide a teaser of important research that is relevant for engineering education.

Many engineering teachers believe that instructional hands-on activities lead to better understanding because "we comprehend and remember things better by doing them ourselves". They recognize these activities as opportunities to innovate and refine teaching methods. However, most of us, whether from past experience as students or practical work instructors, know that students often do not learn much from practical activities. Educational research studies tend to support this observation[1]. Yet, don't be discouraged; the issue is not that instructional lab activities are inherently unsuitable, but rather that they are often poorly designed!

How can we then prove that our hands-on activities are successful? In a remarkable attempt to do "evidence-based educational innovation™", many teachers believe that the only way to prove the effectiveness of practical work requires elaborate (quasi-)experimental educational research setups, complete with a hypothesis for a causal relationship, control and treatment groups, and large, sorted students groups. But things don't have to be so complicated! (you are a engineering teacher and not an educational scientist after all) [2]

If we are interested in the effectiveness of practical work, we really have to consider specific practical activities that we use, or plan to use and the real classroom context in which we are going to operate [2]. Millar's model of effectiveness [3] of practical work, developed within the European Labwork in Science Education project [4], provides a useful tool in this regard.

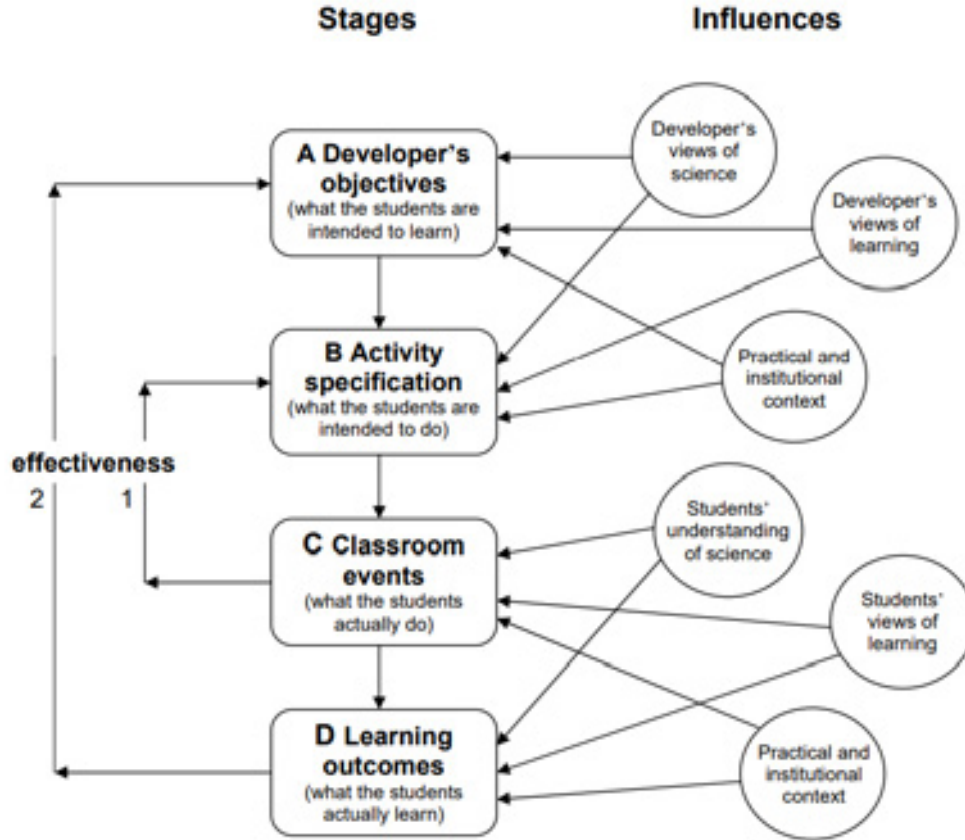
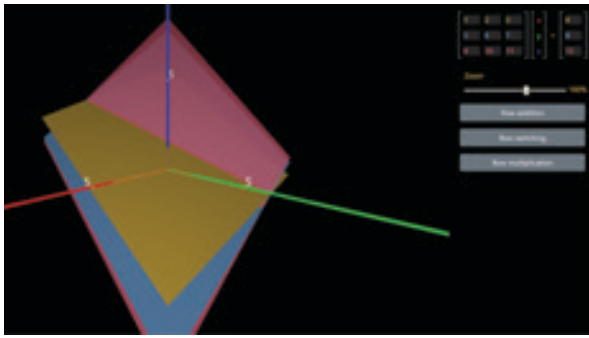


Figure 1 Stages in developing and evaluating a practical activity – and the influences on these

The model [3], shown in figure here above, makes explicit the relationship between the usual steps that instructors undergo in the development and implementation of a practical instructional activity and the effectiveness of the intervention. From this model, the term “effectiveness” can have two meanings. “Effectiveness 1” is the extent to which the activity guided students in doing what they were intended. This is about the relationship between step C and step B. “Effectiveness 2” is the extent to which the activity enabled students to learn what they were expected. This is about the relationship between step D and step A. We could argue then that the most crucial point for the success of the activity is step A: the definition of the Intended Learning Outcomes (ILOs). What would you like the students to learn from this practical activity? Can you specify the insights and skills that students are expected to learn? [5]

1. A. Hofstein and V. N. Lunetta, “The Laboratory in Science Education: Foundations for the Twenty-First Century,” *Sci. Educ.*, vol. 88, no. 1, pp. 28–54, 2004
2. McKenney, S., & Reeves, T. (2018). *Conducting Educational Design Research* (2nd ed.). Routledge. <https://doi-org.tudelft.idm.oclc.org/10.4324/9781315105642>
3. R. Millar, *Analysing Practical Science Activities to Assess and Improve Their Effectiveness*, Association for Science Education, Hatfield, 2010. ([Getting practical](#)).
4. Psillos D, Niedderer H, editors. *Teaching and Learning in the Science Laboratory*, Dordrecht, Kluwer, 2002. pp. 9–20. DOI: 10.1007/0-306-48196-0.
5. L. D. Feisel and A. J. Rosa, “The role of the laboratory in undergraduate engineering education,” *J. Eng. Educ.*, vol. 94, no. 1, pp. 121–130, 2005.



PRIME Applets

Are your students struggling with certain math concepts in your course? No worries, PRIME has got you covered! At prime-applets.ewi.tudelft.nl, you can find a whole portfolio of videos and applets that the PRIME Visuals team has created to help students better understand complex mathematics topics such as: linear systems, differential equations, complex geometry and more!

Education day

On November 9, we were at the Education Day. The day was packed with interesting presentations and workshops. So proud to see that two teachers from the PRIMECH community have each won a 2024 Education Fellowship! Congratulations to **Giuseppe Radaelli** and **Jos Zwanikken** with their achievements. PRIMECH is looking forward to help sharing your good work this coming year!

Moreover, Marta and Marijn have been handing out the amazing new PRIMECH Accelerate notebooks and stickerpacks! Were you not able to receive one yet? Be sure to get one at the next PRIMECH event!



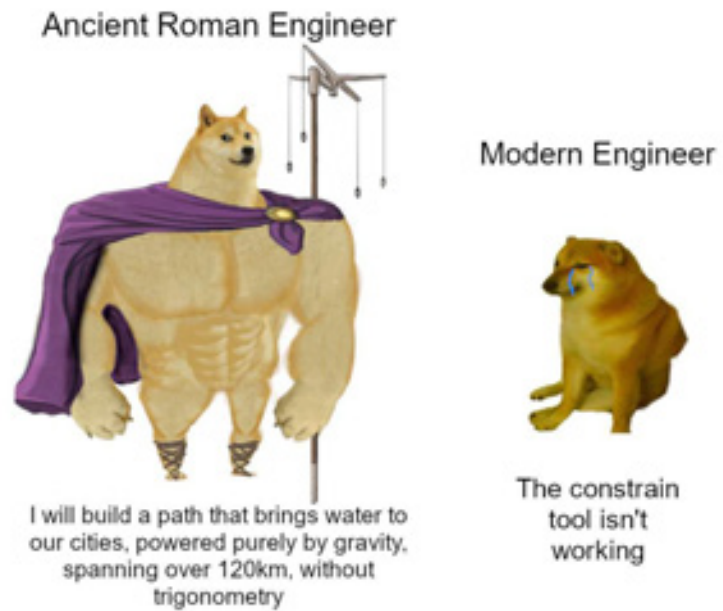
AE Mech + Math meeting

On November 16th, mechanics and mathematics instructors from the Aerospace Bachelor program met to align their courses. This meeting followed up on the 'From Maths to Mechanics' PRIMECH event we organized last May, which aimed to identify challenges students encounter in applying mathematics to mechanical problems during their initial years of engineering studies. The event effectively highlighted several challenges (you can find the results [here](#)). Initially, our plan was to expand on these insights and organise another university-wide meeting for collective solution-finding. However, we determined that focusing on faculty-specific discussions would yield more tangible improvements.

The AE mech + math meeting was highly successful. Teachers collectively agreed on the shared goal aligning the mechanics and mathematics courses by introducing concepts in the right sequence and using each other's examples and materials for reinforcement. To achieve this, a collaborative process has begun, involving teachers from both disciplines analysing their respective course content. We'll keep you updated on the outcomes of this collaboration, as it holds potential inspiration for other faculties as well.

Meme of the month

It is decided, This is our new supplier of mechanics memes, thanks! Do you come across a very good meme yourself? Please send it to PRIMECH@tudelft.nl and we will share it with the others in the next edition!



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Newsletter
Year:2023
Month:10

What is PRIMECH up to?

Hi there, engineers!

Welcome to the PRIMECH newsletter, where we take a closer look at the progress of the PRIMECH project.

In this newsletter:

- Invitation for the **next community event**
- Accelerate presents: **first project** is finished
- In the spotlight: our **new team member**, Thijs Hoedemakers
- **Advisory board** updates
- Monthly Mix
 - PRIMECH Community video
 - Meme of the month



The poster features a blue header with the text "PRIMECH COMMUNITY EVENT" in large white letters, flanked by white brackets. Below this, the phrase "Let's catch up!" is written in a white, italicized font. To the left, the date and time "October 23 12.30 -13.30" are listed, along with the "TeachingLab" logo. In the center, a white text box contains the invitation: "A get together to discuss your hopes and ideas for the next academic year." To the right, a QR code is displayed with the text "Enrol here!" and a white arrow pointing to it. The bottom half of the poster shows a photograph of several people in a meeting room, with white speech bubbles overlaid on the image. One speech bubble contains a drawing of a gear, and another contains a drawing of a person. The TU Delft and PRIMECH logos are visible in the bottom left corner of the photo.

Now that this academic year has finally begun, let's come together and discover what everyone is up to. Were you inspired by the topics from last year PRIMECH events? What are your plans for this academic year? What themes and activities would you like to engage in within the PRIMECH community?

Whether you're new or a long-term member of PRIMECH, this event offers an excellent opportunity for you to connect with other mechanics teachers from across TU Delft and learn about their current projects. We will have

fun with interactive polls and round tables. And, as always, we will provide free lunch!

WHEN AND WHERE: 23rd of October, 12.30 to 13.30 at Teaching Lab, Building 32a [v](#)

Please, enroll, so there will be food for everyone. Once enrolled, you will receive an Outlook calendar invitation.

Enroll now



First Accelerate project finished

With PRIMECH Accelerate, there are many types of projects that we can help you with. Here is a showcase of our first fully finished project: a software tool. Does this spark your interest? Contact us, and we can have a chat about what Accelerate can do for you! See our [website](#) for more info.

A COZ to ANS converter

Last year February, we started collaborating with Tom van Woudenberg (CEG) to develop a tool that would help the CEG mechanics department transfer questions from an old and deprecated assessment program COZ, to the new question platform ANS. To enable that ANS could import questions from COZ with one press of a button, we developed a script that converted COZ exports to a format that was readable by ANS. This has saved a lot of manual work, as the tool has already converted 1500 questions for mechanics courses and supports figures, parametric questions and much more!

You can find the open-source repository for this tool [here](#). Do you also want to convert your questions from COZ to ANS? Get started with the tool and contact us at PRIMECH@tudelft.nl if you need any help!



In the spotlight:

THIJS HOEDEMAKERS



A new member of the PRIMECH Core team

I'm a junior lecturer at 3mE within cognitive robotics. I graduated with Luka Peternel on cerebellar modelling, a collaboration with the Neuroscience department in Rotterdam. For now I support at different courses at 3mE, such as Vision&Reflection and the Joint Interdisciplinary Project. Parallel to that I am getting my certification to become a high school mathematics teacher!

I like to brainstorm ideas and organize events to contribute to the innovation of mechanics education. From time to time I use my mechanical engineering background to verify if the mechanical memes and stickers are valid.

A bit about me: I'm 27 years old. In my spare time I volunteer at RotterdamRijker, I like to read (recommendations are always welcome, but the to-read list is already quite long 😊) and I like physical activities

Advisory board updates

Last month, we called for members to join the PRIMECH Advisory Board, **and our enthusiastic community responded!** The Advisory Board is rapidly taking shape and the first meeting has been already scheduled for November 17th.

Currently, the board includes **representatives from the faculties of AE, AS, CEG, EEMCS and 3ME**, along with one member from the **Teaching and Learning Services** and one from the **Central Student Council**. If your faculty isn't listed, and you'd like to represent it on the board, you still have the opportunity to apply [here](#).

Stay tuned for further details in our upcoming newsletter as we finalize the board composition. We can't wait to bring you with us on this exciting journey.

Monthly Mix



PRIMECH Community video

Together with the New Media Centre, we have created two amazing videos to show what PRIMECH is all about. The first video is now out, explaining the basics of PRIMECH and showcasing our amazing community. Do you recognize anyone of your fellow colleagues in the shots?

PS. Credits to Veronica for making the wonderful animations in the video. Do you want to develop such videos for your own course? With PRIMECH Accelerate we can help you with that!

Meme of the month

Thanks to Thijs for finding this one. Do you come across a very good meme yourself? Please send it to PRIMECH@tudelft.nl and we will share it with the others in the next edition!



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Newsletter
Year:2023
Month:09

A monthly newsletter brought to you by the PRIMECH team

Hi there, engineers!

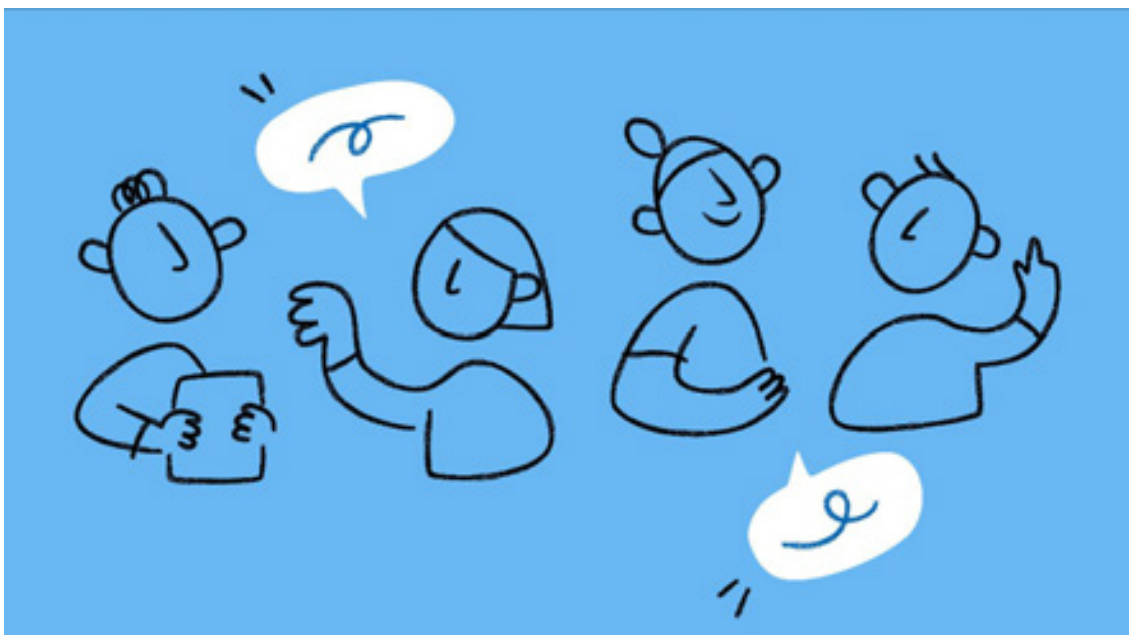
Welcome back to a new exciting academic year and to the [PRIMECH](#) newsletter, where we take a closer look at the progress of the PRogramme of Innovation in MECHANics education.

This month we take a look at:

- [Call for members PRIMECH Advisory Board](#)
- [PRIMECH Accelerate](#)
- [Recap PRIMECH Events AY22-23](#)
- [PRIMECH Goals AY23-24](#)
- [In the spotlight: PRIMECH core team](#)
- [Monthly Mix](#): Just Herder Leermeester 2023 and a tensegrity table.
- [Call for Community Minutes](#)

In case you missed them, you can find the previous newsletter issues [here](#). If you know people that might be interested in this newsletter, they can subscribe [here](#).

[Call for mechanics teachers to join the PRIMECH Advisory board](#)



Are you a mechanics teacher **passionate about innovating mechanics education and equipped with a vision** for achieving this goal? If so, [we invite you to become a member of the PRIMECH Advisory Board at TU Delft.](#)

Why does PRIMECH need an Advisory Board?

PRIMECH was initiated with temporary funding set to conclude in August 2024. After two years of dedicated effort in building the PRIMECH community, **it's now time for the community to shape its own path forward.** An advisory board can play a crucial role in determining this direction.

What does the PRIMECH Advisory Board do?

As a member of the PRIMECH Advisory Board, you will have a unique opportunity to:

- **Shape PRIMECH's Future:** Make informed decisions with your fellow board members regarding the future direction, structure, and initiatives of PRIMECH.
- **Ensure Sustainability of the PRIMECH Community:** Provide your advice on events and initiatives so they match the needs of bachelor-level mechanics teachers, in this way ensuring that PRIMECH delivers real value to its members and remains relevant in the long-term.
- **Provide Expert Insight:** Offer valuable insights and guidance to the PRIMECH core team on mechanics content and pedagogical approaches, so PRIMECH activities and content can stay close to their mechanics core.
- **Be a Spider in the Web:** Give updates to your fellow board members on what is going on at your faculty, so mechanics teachers will stay up-to-date with what other education innovation projects there are happening at the university.
- **Chocolate and gadgets:** As a member of the advisory board, you'll enjoy unrestricted access to the PRIMECH chocolate and gadgets stash (yes, we're serious).

Time commitment:

Flexible involvement with a minimum requirement of one (free-)lunch meeting once or twice per quarter.

Board membership and faculty representation:

We seek a diverse PRIMECH Advisory Board with 5 to 8 members, prioritising equal faculty representation, fostering a balanced view of mechanics education at TU Delft.

More details and how to apply:

Please fill in [this form](#) or send us (PRIMECH@tudelft.nl) a brief email including your name, faculty, and the mechanics-related course you teach. Additionally, we are curious to know more about your interest in joining the PRIMECH Advisory Board. [Here](#) you can download the official call with more details.

Application Deadline: 25th of September

APPLY HERE

[PRIMECH Accelerate](#)

This academic year we are introducing a new initiative: PRIMECH Accelerate. Our goal with this **1-on-1 program** is to provide mechanics teachers with tailored educational support, empowering them to innovate their mechanics courses.

Find in the outline here below all the details of this initiative:

PRIMECH
Accelerate

FOR WHO
Passionate teachers.

WHAT
We provide support and resources to develop innovative teaching materials and activities.

HOW MUCH
Free of charge!

STEP 1
You're a teacher with an idea to improve students' learning, but you don't have the time to make it happen.

STEP 2
Contact us at PRIMECH@tudelft.nl and book a meeting. We will provide you with the necessary resources to make your idea take off.

STEP 3
Enjoy seeing your idea out there, improving students' learning outcomes!

How it works

Impact
Helping more students adopt a deep approach to learning.

Contact us at PRIMECH@tudelft.nl

As examples, we can give you support with **restructuring course content, creating visualisations, videos, tools, teaching modules, formative assessments, demonstrations, lab activities**, and other such elements that innovates the teaching of mechanics subjects.

This support is free of charge! We showcased some projects we worked on during the last academic year in [this presentation](#).

We are looking forward to hearing about your ideas to innovate your Mechanics course!

[Recap last academic year PRIMECH events](#)

Looking back on the past academic year, PRIMECH was bustling with activity! We learned and connected in many ways. Do you recall all seven of the events we hosted? Here's a quick recap:

Guest-Expert Talks: We had 3 sessions with expert teachers sharing their insights:

- [Ron Haaksman \(AS\) on in-class demonstrations.](#)
- [Calvin Rans \(AE\) and Tom van Woudenberg \(CEG\) on ANS and formative assessment.](#)
- [Otto Visser \(EESCM\) on gamification strategies.](#)





[Mechanics-Math Event](#): together with PRIME teachers, we explored the mystery of the missing link between mechanics and math education.

[Concept Mapping](#): We worked together to create concept maps using the [Course Graph applet](#).

Community Celebrations: We celebrated as a community the [winter](#) and [summer](#) holidays.



These events enriched our knowledge, improved our teaching, and strengthened our bonds. Let's carry this spirit forward into the new year!

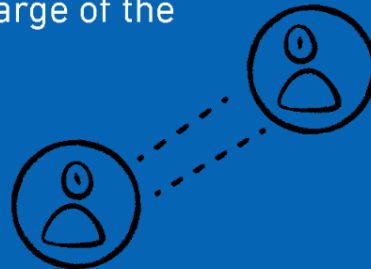
[PRIMECH Goals for the Academic Year 2023/2024](#)

With the start of the new academic year, **we've resumed our regular posts on the LinkedIn PRIMECH page** (follow us here: <https://www.linkedin.com/company/tu-delft-primech/>).

Take a peek at our first post where we're diving into **PRIMECH's goals for the year**. We believe in keeping things transparent and **we encourage you to hold us accountable**. Check out a concise summary of this year goals in the slide below:

PRIMECH objectives for 2023-2024

- Continue our community events:
 - * Invite guest experts
 - * Host community celebrations
 - * Organize in-depth focusgroups and workshops
- Get more impact in the mechanics classrooms with PRIMECH Accelerate:
 - * Advice teachers on their education projects
 - * Support them with the needed resources
 - * Get others involved for cross-faculty relevance
- Ensure sustainability of the community over time:
 - * Set up an advisory board of mechanics teachers
 - * Empower teachers to take charge of the PRIMECH community



In the spotlight: PRIMECH core team AY 2023/2024

With new beginnings often come farewells. This year, **we say goodbye to two valued members of our PRIMECH core team: Grant Penny and Astrid van der Niet.** Thank you for the exceptional contributions you made last year and wish you every success in your new adventures!

As a quick reminder, **the team members who continue on this exciting journey are Marta Gavioli, Veronica Comin, Marijn Roelvink, and Hans Hellendoorn.** Get to know our faces in the slide below:

'23/ '24 PRIMECH team

The PRIMECH team for 2023/2024 is presented in a grid of four hexagonal portrait photos. Each photo is accompanied by the name and role of the team member.

- Marta Gavioli** (Project Leader)
- Hans Hellendoorn** (Project Supervisor)
- Marijn Roelvink** (Community Facilitator)
- Veronica Comin** (Workshop Designer)

[Monthly mix](#)

Just Herder, Professor of Excellence / Leermeester 2023

We couldn't be prouder of Professor Just Herder, a longstanding member of the PRIMECH community. On July 3rd, he received the well-deserved title "Professor of Excellence / Leermeester 2023." **This award acknowledges his incredible contributions to both research and teaching.** Just isn't just a Professor in Interactive Mechanisms and Mechatronics; he also teaches Statics to first-year bachelor students in 3ME.

If you haven't already, **don't miss the opportunity to watch the speech Just gave at the official award ceremony [here](#)**, starting at the 38th minute. In his presentation, Just delves into his academic journey and the evolution of his passion for Mechanics, making it an incredibly inspiring experience. Additionally, **the Teaching Academy has set up a webpage to ["Get inspired by Prof. Just Herder"](#)**, where they'll announce future presentations and events.

Meme of the month:

Tensegrity table: destroying your brain or oddly satisfying? let's discuss!

Engineering is awesome



Call to all teachers doing interesting things: [Come talk at the Community Minutes!](#)

Got something exciting to share with your fellow teachers? Now's your chance! **Our events now feature "Community Minutes," a 5-10 minute slot where teachers can share something they're passionate about,** such as:

- A book or paper you've read or written
- A project you're working on or an idea for one

- A new demonstration you've created :)
- Anything else you'd like to share

To present in the next Community Minutes, just drop us an email before October 1st.

And if you know someone who would be great at this but doesn't read our amazing newsletters, make sure to pass this along!

Plus, if you'd rather share your expertise through writing, consider contributing to our newsletter.

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Currently, the **PRIMECH team** members are **Marta Gavioli**, project leader; **Veronica Comin**, workshop designer; **Marijn Roelvink**, community facilitator and **Hans Hellendoorn**; project supervisor.

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PRIMECH · Mekelweg 2 · DELFT, Zuid-Holland 2628 CD · Netherlands



Newsletter

Year:2023

Month:07

A monthly newsletter brought to you by the PRIMECH team

Hi there, engineers!

Welcome to the [PRIMECH](#) newsletter, where we take a closer look at the progress of the PRIMECH project.

This month we take a look at:

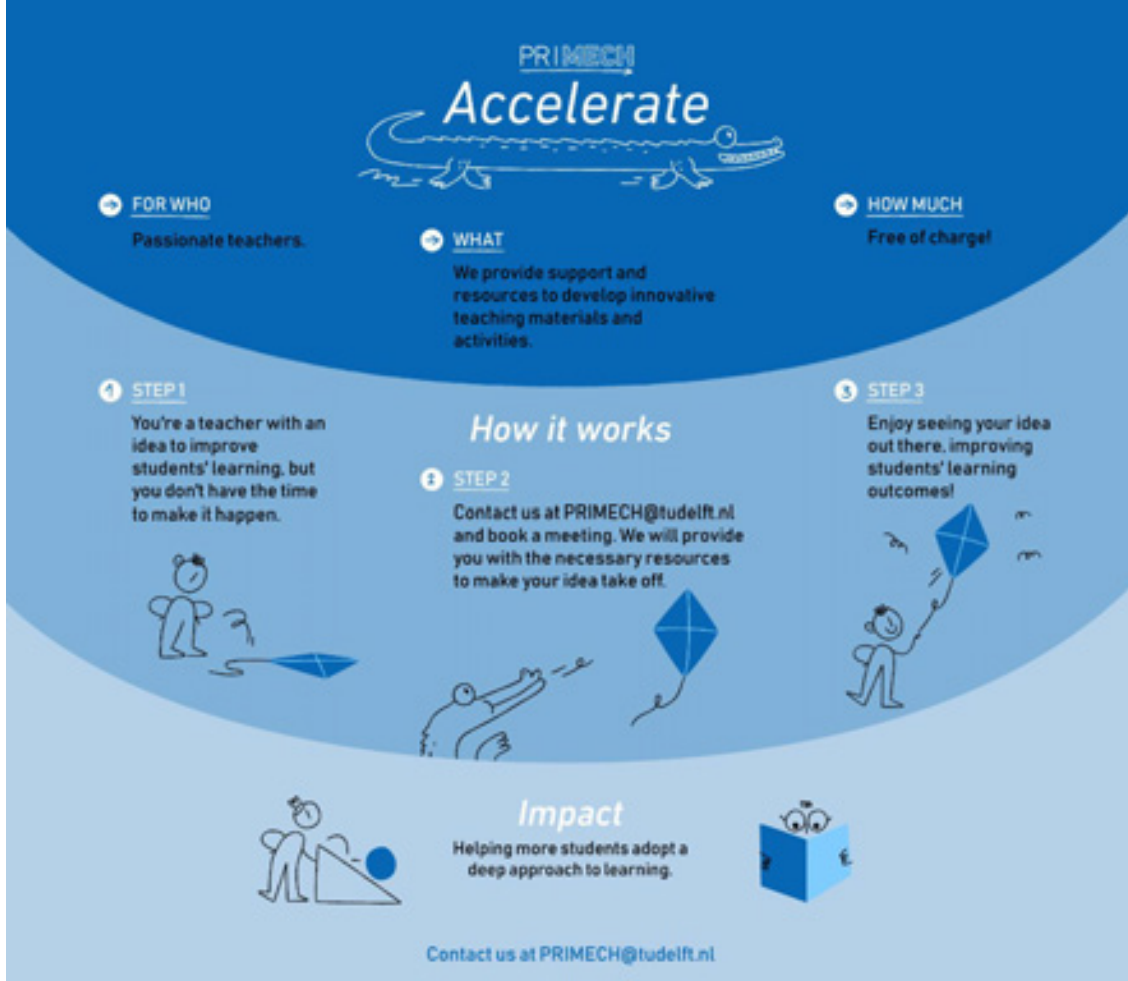
- [PRIMECH Accelerate](#): get Free Support to Innovate your Mechanics Course!
- [Insights from the 19th International CDIO Conference](#)
- [Our conference paper](#) on the Mechanics Teachers Social Club
- [Teacher of the Month](#): Eddy van den Bos, CAD teacher in AE
- [Monthly Mix](#): CAD teachers lunch, PRIMECH stats, memes and more!

In case you missed them, you can find the previous newsletter issues [here](#). If you know people that might be interested in this newsletter, they can subscribe [here](#).

[PRIMECH Accelerate](#)

We are so happy to launch our new initiative: PRIMECH Accelerate. Our goal with this **1-on-1 program** is **to provide mechanics teachers with tailored educational support, empowering them to innovate their mechanics courses.**

Find in the outline here below all the details of this initiative:



As examples of the kind of support we can provide, we showcased some projects we worked on during the academic year in [this presentation](#).

We are looking forward to hearing about your ideas to innovate your Mechanics course!

[Insights from the 19th International CDIO Conference](#)

We're excited to share some highlights from the 19th International CDIO Conference held in **Trondheim, Norway, from July 26th to July 29th, 2023**. CDIO is an **educational framework for Engineering Education**, centred around the core engineering processes of **Conceiving, Designing, Implementing, and Operating (CDIO)**. The framework has been widely adopted in higher education. The **international conferences serve as a hub for educators** from around the world to come together and exchange ideas, insights, and innovative approaches to teaching.

This year, **around 300 attendees** joined the conference, creating a rich environment for networking and knowledge exchange. The theme of this year's conference was **"Engineering Education for a Smart, Safe, and Sustainable Future."** This theme emphasised the importance of teaching future engineers the right skills and knowledge to solve the problems of the future and create a smart, safe, and sustainable world.



The conference offered a **variety of session types**, including podium presentations, posters, workshops, round-table discussions, and working groups. With a diverse range of engagement opportunities, attendees had the chance to participate in **dynamic and collaborative sessions**. The main topics discussed were Sustainable Education and Practices, Curriculum Development and Agility, Active Learning and Pedagogical Approaches, Diversity and Inclusion, Skills Development and Professional Growth.

PRIMECH had the pleasure of participating in the conference, and **we were thrilled to discover around 15 colleagues from TU Delft in attendance**. The conference provided an invaluable opportunity for networking and reconnecting with familiar faces. The presence of our passionate colleagues from TU Delft made the event even more memorable. **Huge thanks to the organizers from NTNU and CDIO for crafting such an enriching experience**. We can't wait to put these insights into action.

Please note that the proceedings of the 2023 conference are yet to be published. **For more information about this and future conferences**, including session details, we encourage you to visit the [conference website](#).

PRIMECH rocked the 19th International CDIO Conference in Trondheim! On June 29th, Marta and Grant took the stage to present their paper on **'Conceiving, Designing, and Implementing the Mechanics Teachers Social Club.'** Despite the massive auditorium and a formal atmosphere, they brought the lively PRIMECH spirit to the audience and they **shared the journey of PRIMECH**, starting from its conception in October 2021 to the launch of PRIMECH Accelerate in June of this year, complete with our beloved alligator mascot!



Marta covered the background and reasons behind PRIMECH's creation, including the identified problem of teachers working in isolation and students struggling with conceptual understanding. She connected PRIMECH's process to the stages of conceiving, designing and implementing. Grant then continued to discuss the operating phase, elaborating on the goals achieved in the past year and introducing the audience to our recent and upcoming initiatives.



We received an amazing response, and one of the conference's best questions was directed at us: "What I like about TU Delft is that you actually do something! How do you do that?" The audience's enthusiastic feedback left us beaming with joy. It turns out that **creating inter-faculty communities of practice is a common challenge faced by many universities**, which is why our presentation struck a chord and garnered significant interest!

If you're interested, find here the [paper](#) and the [presentation slides](#)!

[In the spotlight: Teacher of the month](#)

This section highlights the teachers who are contributing significantly to the PRIMECH community. We're thrilled to introduce you to these educators who are passionate and committed to making our community stronger than ever!



EDDY VAN DEN BOS: CAD specialist / teacher in AE

- *Who are you and what is your actual role at TU Delft?*

My name is Eddy van den Bos and I am the CAD (Computer Aided Design) specialist of the Aerospace Engineering faculty.

- *Do you have any hobbies?*

I am passionate about music, and I play bass guitar in the melodic punk rock band Cooper since 1992.

- *What are your plans on Technical Drawing education?*

The main challenge we face is the sustainability challenge. We can face this issue by improving our efficiency. I believe we can do this by teaching our students to use the design and engineering tools available as smartly and efficiently as

possible. Keywords: collaboration and digitalisation.

- According to you, what are the advantages of being in PRIMECH?

Since society requires us to collaborate more and more, preferably in a multi-disciplinary way, it is key to know your peers. PRIMECH has offered me an infrastructure to get in contact with my peers. I am looking forward to start collaborating with them!

Monthly mix

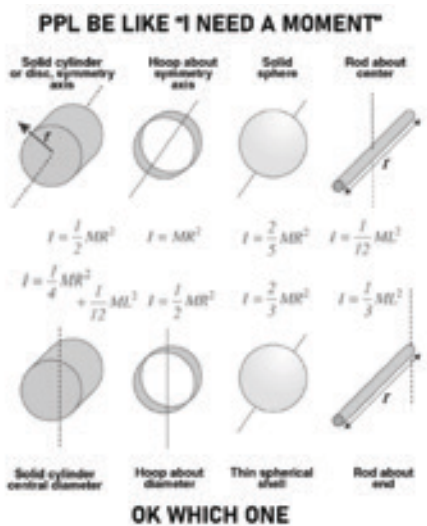
CAD teachers lunch

Yesterday, July 20th, we had the exciting opportunity to inaugurate a Special Interest Group (SIG) for CAD and technical drawings teachers at TU Delft. This is **one of our first Accelerate Initiative**, driven by the request of Eddy van den Bos.

The lunch meeting brought together **passionate teachers from various faculties**. Participants introduced themselves and the courses they teach in the different TU Delft faculties. We then explored challenges and identified opportunities to enhance these subjects collaboratively. Key discussions focused on the current software usage, leading to constructive solutions and best practices.

All teachers enthusiastically joined the newly formed SIG. An MS Teams team will be launched soon, facilitating communication and material sharing among SIG members. **We are looking forward to seeing this group grow!**

Memes of the month:





Summer is here, and it's time to unwind! The PRIMECH team will be back in September. Wishing you all awesome summer vacation – soak up the sun and make some great memories! Happy summer!
The PRIMECH Team

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Currently, the **PRIMECH team** members are **Marta Gavioli**, project leader; **Grant Penny**, educational advisor; **Veronica Comin**, workshop designer; **Marijn Roelvink**, community facilitator and **Hans Hellendoorn**; project supervisor.

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Newsletter

Year:2023

Month:06

Hi there, engineers!

Welcome to the [PRIMECH](#) newsletter, where we take a closer look at the progress of the PRIMECH project.

This month we take a look at:

- [Insights from the PRIMECH Summer Vrijmibo](#)
- [PRIMECH Accelerate](#): get Free Support to Innovate your Mechanics Course!
- [The Research Corner](#): Skills Development
- [Teacher of the Month](#): Freek Pols, Physics Practicum Lecturer/ Innovator in AS
- [Monthly Mix](#): CDIO, MS Teams, Throwbacks and a Meme

In case you missed them, you can find the previous newsletter issues [here](#). If you know people that might be interested in this newsletter, they can subscribe [here](#).

[Insights from the PRIMECH Vrijmibo](#)

Last Friday, on June 16th, we hosted our **end-of-the-year vrijmibo!** The event started at 16.00 with an exciting presentation of PRIMECH's new initiative: **Accelerate, with the Accelerator Alligator mascot** :) Our goal with this 1-on-1 program is to provide mechanics teachers with tailored educational support, empowering them to innovate their mechanics courses. Curious to know more? [Skip to the following section.](#)



To get the ideas brewing and give a better insight as to how PRIMECH Accelerate might help ambitious teachers, **we did a serious(ly fun) game in the form of an alligator tank**: participants were divided in groups and had to come up with education innovation ideas which they would then pitch to the PRIMECH team. The team then provided suggestions on how Accelerate could help with the respective proposal.



But, there was one big catch in the game: **each group had to base their idea on a set of requirements from randomly picked cards**. So for one group, the challenge was for example to develop "A new teaching module for 900 bachelor students, but no one in your department is willing to help you or give you TAs."

If you wish to play this game too, [here are the instructions](#) and [here are the cards](#)!



Amazing ideas were generated, such as:

- **Mech World:** A playground throughout the Mekelpark with installations that let students physically experience mechanics topics. (The original challenge: Develop a classroom demonstration for 10 students to increase their conceptual understanding of mechanics)
- **Mechanics meets the world:** a community-driven project where students choose their own real-world problems to solve in a virtual environment and are graded through peer feedback. (The original challenge: Make a new teaching module for 900 bachelor students, but no one in your department is willing to help you or give you TAs)
- **Bridging mechanics:** Letting students design their own bridges in an app, which they then build in real life using spaghetti. (The original challenge: Create a set of lab experiments without spending any money on it).



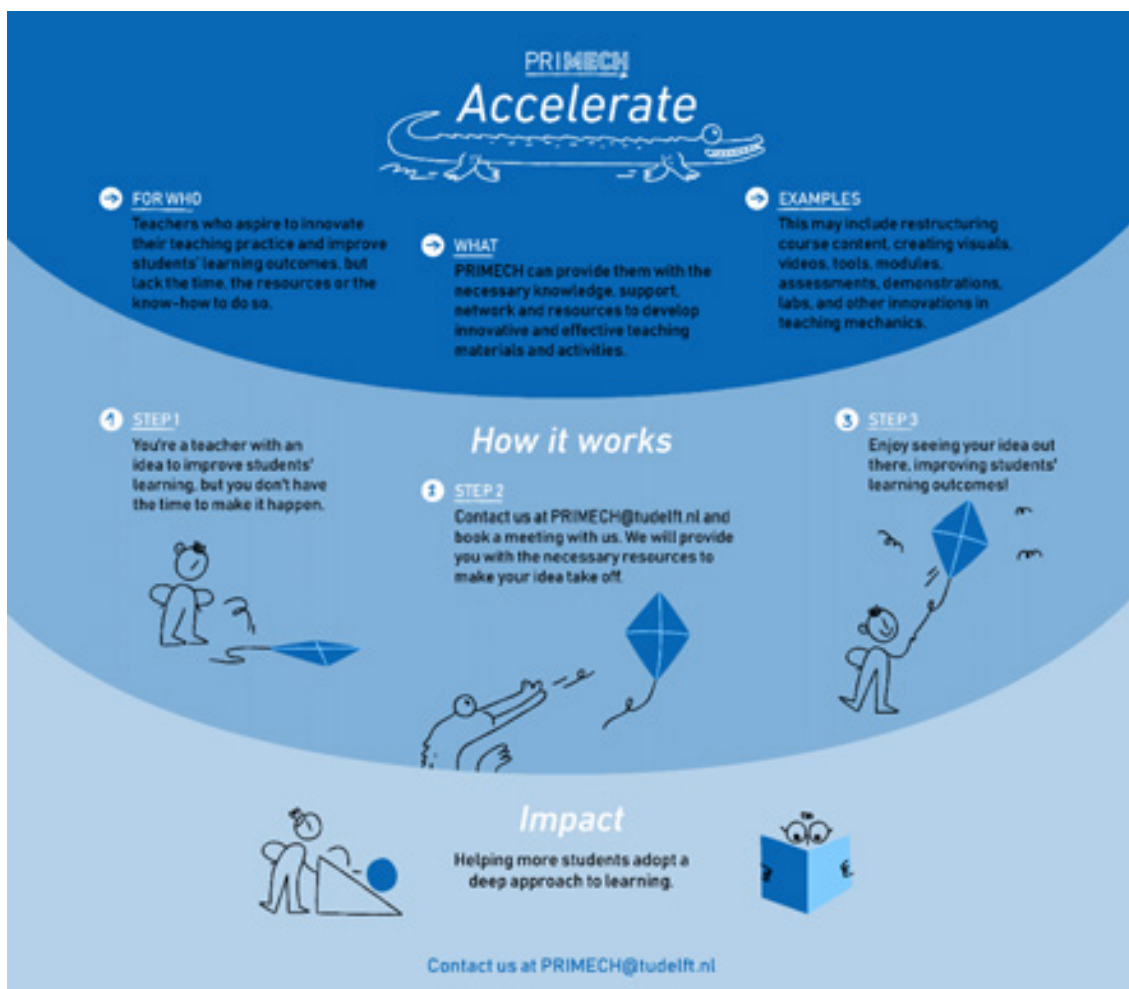
Afterwards, it was time for drinks and some good conversation that lasted until 19.00. **A great celebration of this past year!** We also said goodbye to one of our team members, our content expert, who will leave TU Delft: thanks Astrid van der Niet for all the great work this year!



[PRIMECH Accelerate](#)

We are so happy to launch our new initiative: PRIMECH Accelerate. Our goal with this **1-on-1 program** is **to provide mechanics teachers with tailored educational support, empowering them to innovate their mechanics courses.**

Find in the outline here below all the details of this initiative:



As examples of the kind of support we can provide, we showcased some projects we worked on during the academic year in [this presentation](#).

We are looking forward to hearing about your ideas to innovate your Mechanics course!

Welcome to the EngEdu Research Corner, a new addition to the PRIMECH monthly newsletter, **where we provide a teaser of important research that is relevant for engineering education.**

A holistic education can, and should, extend beyond the core-discipline content. This notion is shared by many, including our very own Vision on Teaching and Learning, and notably by renowned academic philosopher Gert Biesta (2009). An important way to go beyond core-content is to consider which supporting skills your students might need to become world-class engineers.

Research into skills development is wide-ranging, and goes by a myriad of terms such as transferable skills, transversal skills, professional skills, and so forth, each with their own overlapping yet distinctive core focus areas. It is therefore understandable that one can feel uncertain about which skills to focus on.

One approach to this conundrum is to ask the question: **"what would I like my students to achieve, and what skills would they need to achieve such?"** This is an approach taken by Una et al. (2022), who asks what skills are required by students to meet the challenges of the United Nations' sustainable developing goals. In addition to categorising identified skills by terms such as 'systems thinking competency', 'normative competency' and so forth (2022: p10), the authors split their findings into those found to be important by students, academics, and employers.

Although there are commonalities, such as all three agreeing that competency in ethics is important, there are mismatches, such as where academics and employers find inter-cultural awareness to be critical, but students do not. **Reasons for such disparities are unclear, but make for interesting and important reading as you consider which skills you would like to integrate into your class.**

Read the full paper at the link below:

[Beagon, U., Kövesi, K., Tabas, B., Nørgaard, B., Lehtinen, R., Bowe, B., ... & Spliid, C. M. \(2022\). Preparing engineering students for the challenges of the SDGs: what competences are required?. European Journal of Engineering Education, 1-23.](#)

[Biesta, G. \(2009\). Good education in an age of measurement: On the need to reconnect with the question of purpose in education. Educational Assessment, Evaluation and Accountability \(formerly: Journal of Personnel Evaluation in Education\), 21, 33-46.](#)

In the spotlight: Teacher of the month

This section highlights the teachers who are contributing significantly to the PRIMECH community. We're thrilled to introduce you to these educators who are passionate and committed to making our community stronger than ever!



FREEK POLS: Physics Practicum Lecturer/Innovator in AS

- Who are you and what is your actual role at TU Delft?

I am Freek Pols, coordinator of the first years physics lab course and physics education researcher. I am also one of the TUD's education fellows. The goal of this project is to start a collaboration between introductory lab course teachers at our faculty.

- Do you have any hobbies?

I like to run. 10 EM [10 English Miles =16,1km] is my

favourite distance so far. It is far more challenging than a 10K, but not as far as a half marathon (though I run the 21,1 km quite often).

- What are your plans for Mechanics education?

In 2019 I started working at the TU Delft. I then transformed the lab course. Recently we submitted a paper in which we investigate whether we attained the goals set for this project. There are some interesting outcomes that may further guide the transformation of this course (and others). I intend to further implement these findings and help others in improving their education.

- According to you, what are the advantages of being in PRIMECH?

It is a great opportunity to meet enthusiastic teachers who are willing to innovate and improve their teaching. The meetings offer the possibility to exchange experiences and help each other one step further.

Monthly mix

PRIMECH is going to CDIO!

PRIMECH will be heading to Trondheim later this month for the [19 International CDIO Conference](#). We will be presenting on '[Conceiving, Designing and Implementing the Mechanics Teachers Social Club](#)' on Thursday 29th of June, at the 11.00 am parallel podium session in room R1. If you would like to learn more about our involvement, feel free to reach out to Marta or Grant. And importantly, if you will be presenting there, please let us know so we can support each other!

CDIO is an educational framework for Engineering Education. The framework works with the engineers' process as fundamentals: Conceiving, Designing, Implementing and Operating (CDIO). This process has been adopted by educators all over the world. The conference brings all those people together to share their lessons and innovative ways of teaching.



Meanwhile, on MS Teams...

A quest for someone who knows things about FEM and gears:

A hobbyist is struggling with a racecar with a weak gear and he thinks a FEM calculation could help solve this. Do you have ideas about this? Join the conversation on the [PRIMECH Teams!](#)

PRIMECH Throwback

For the vrijmibo, we compiled a running **photo slideshow** of all the highlights and events of this year! You

can view it [here](#) and reminisce about all the inspiring conversations and good lunches :)

Meme of the month:



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Newsletter
Year:2023
Month:05

A monthly newsletter brought to you by the PRIMECH team

Hi there, Engineers!

And welcome to the [PRIMECH](#) newsletter, where we take a closer look at the progress of the PRIMECH project.

This month we take a look at:

- [SAVE THE DATE](#): Celebrating PRIMECH's 2nd year
- ["From Maths to Mechanics" event](#): the mystery of the missing link
- [The mystery, solved!](#)
- [Monthly Mix](#): LinkedIn, CAD meeting and memes

In case you missed them, you can find the previous newsletter issues [here](#). If you know people that might be interested in this newsletter, they can subscribe [here](#).

[YOU ARE INVITED! Celebrating PRIMECH's second year](#)



WHAT

Let's celebrate the ending of a wonderful academic year and the PRIMECH community!

We will also present our plans for next academic year and **we will launch our new initiative: PRIMECH Accelerate**. This focuses on offering 1-on-1 educational support for getting new projects of the ground, tailored specifically for mechanics teachers. This will be kicked off with an energising workshop to get the ideas flowing.

The event will be followed by a borrel to celebrate the ending of the academic year and everyone who has contributed to the project.

Would you like to know more about PRIMECH and our new initiatives to innovate mechanics education? We'd love to share this year's program accomplishments and community growth with you.

Enrol [here](#), so there will be food for everyone. Once enrolled, you will receive an Outlook calendar invitation.

WHO

The event is open to the entire PRIMECH community, including our esteemed strategic partners, invaluable stakeholders, and anyone passionate about enhancing (mechanics) education at TU Delft. We extend a warm invitation to **all who have contributed to this project so far** and to those with a keen interest in the subject. Teaching assistants are also encouraged to attend!

WHEN AND WHERE

Friday, 16 June from 16:00 - 18:00 at the Teaching Lab [v](#).

AGENDA:

16:00 - 16:30: PRIMECH Accelerate presentation

16.30 - 17:00: Alligator-tank: networking and innovation accelerator activity

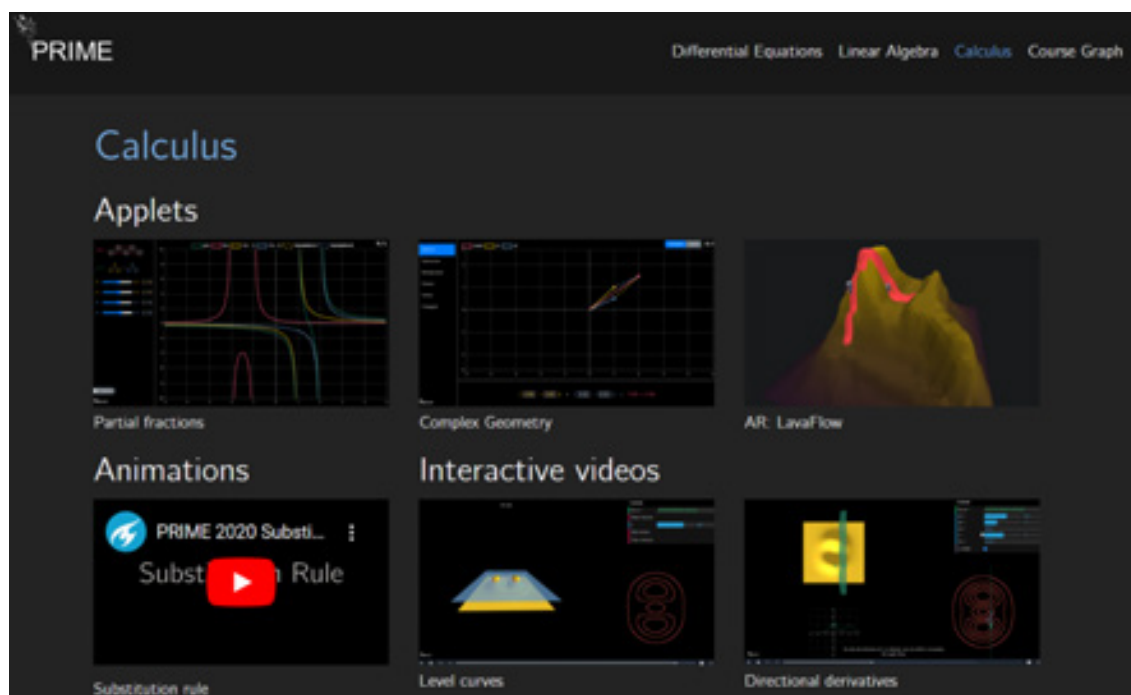
ENROL HERE

["From Maths to Mechanics": the mystery of the missing link](#)

On Thursday, May 25th, we hosted our PRIME (Programme of Innovation in Mathematics Education) + PRIMECH event, a **collaborative session with maths and mechanics lecturers, students, and learning developers**. The event aimed to define the challenges that students encounter when applying mathematical concepts in their mechanics courses.



The event kicked off with an engaging presentation by Tom Vroegrijk, the head of PRIME, who provided valuable insights into the programme. Tom highlighted the collaborative efforts of PRIME lecturers, who work together to offer an extensive range of maths courses spanning across nearly all TU Delft faculties.



During his talk, **Tom showcased captivating teaching materials developed by PRIME**, specifically designed to help students visualise abstract mathematical concepts and their practical applications in

engineering. A selection of these materials can be found in the [PRIME portfolio](#). For access to the complete list of developed materials, we encourage you to reach out to Tom, who will be delighted to share them with you.



Afterwards, we jumped into a fun activity, where the event participants got divided into five teams. The maths teachers became the investigators, while the mechanics teachers and students played the part of witnesses. It was a collaborative activity that brought everyone together and **sparking lively discussions between the maths and mechanics lecturers**.



Each team was tasked with discussing and solving the mystery: "What are the challenges that hinder students' seamless use of mathematics in the study of mechanics?". Once more, we want to express our sincere gratitude to all the participants who played a vital role in making this event a great success. The challenges identified and the initial solutions proposed by each team have been gathered and shared in the section below. As we celebrate the achievements of this event, we eagerly look forward to the future. In the next academic year, we plan to organise another event to dive deeper into these findings and continue exploring together the solutions to these challenges.

The mystery, solved!



Maths provide students with foundational knowledge to comprehend mechanics and other engineering subjects. In mechanics, mathematics plays a vital role in modelling the physical world and in solving complex problems through fast symbolic manipulation. However, **students often struggle to establish a clear connection between these two subjects.**

Why does this disconnect exist? **We have summarised the challenges and some potential solutions identified by our teachers teams here below.**

Identified challenges

Connecting maths and mechanics courses:

- It's difficult to include relevant mechanics concepts and examples in maths courses at the beginning because they require advanced knowledge.
- There's not enough time to teach all the maths tools needed for modelling in mechanics courses and show how they are applied in students' future studies.
- There's a problem with the order of teaching; if you start with maths, its real-life meaning is unclear, but if you start with mechanics, students can't solve problems due to a lack of maths background.

Knowledge transfer and retention:

- Time gaps between maths (like linear algebra) and mechanics courses result in forgetting important theories.
- Differences in conventions, procedures, and terminology between maths and mechanics courses lead to confusion and memory overload for students.

Effects of examination methods and students' study attitudes:

- Students prioritise answering questions rather than understanding the underlying concepts and theory.
- Students aren't encouraged to actively retain their maths knowledge; instead, they focus on studying hard for exams and then forgetting the material before the mechanics courses start.
- Gaining a good understanding of maths and bridging that knowledge to mechanics requires a lot of study and practice, but students often don't / can't invest enough time in it.

Preliminary list of solutions

Short-term solutions:

- Explore the option of visiting each other's courses and reviewing each other's materials. This can be facilitated by the Teaching Academy's TUnder initiative, which you are welcome to join.

- Enhance cohesion between maths and mechanics courses to improve the understanding of their connection:
 - Incorporate more real-life examples in maths courses to demonstrate why and how maths is applied in engineering studies.
 - In mechanics courses, refer students to relevant maths modules to refresh their prior knowledge.
 - Consider implementing specific maths modules as minimum requirements to complete the mechanics course.

Mid-term solutions:

- Develop a YouTube playlist featuring existing PRIME videos and mechanics teachers utilising maths to solve mechanics problems.

Long-term solutions:

- Introduce a new course focused on complex problem-solving strategies, such as breaking down problems into smaller parts or initially solving simplified versions of problems.

We aim to organise **another event after summer** to follow up on the 'discoveries' and find ways to tackle this challenges together.

If you have any additional insights or thoughts on this topic, **we encourage you to continue the discussion** on our [PRIMECH MS Team](#) or contact us via email at PRIMECH@tudelft.nl

Monthly mix

Meanwhile on LinkedIn...

...we discussed the amazing [Junior Lecturer program of 3ME](#)...

...talked about the fascinating story of the escape of [John Argyris across the Rhine](#)...

.... and shared the first outcomes and pictures of our [PRIMECH+PRIME event!](#)

20-07 Technical drawing teachers meeting

On July 20th from 12.00 to 13.00, PRIMECH is hosting a eat-meet-and-greet for all the technical drawing, CAD, and 3D modelling teachers on campus (yes, the date has changed :) . This is the perfect opportunity to mingle, network, and find out what's new and exciting in this field. We have to admit, finding out who teaches these courses at our university has been quite the challenge. So if you happen to be a technical drawing teacher or know someone who is, please spread the word! You can enrol [here](#). Can't wait to see you there!

Meme of the month:

In this issue, we have not one, but two memes that will leave you chuckling while pondering the intricate bond between mechanics and mathematics.



Education & Students Affairs. Our focus is on innovating **Bachelor level Mechanics courses**.

Currently, the **PRIMECH team** members are **Marta Gavioli**, project leader; **Grant Penny**, educational advisor; **Veronica Comin**, workshop designer; **Marijn Roelvink**, community facilitator; **Astrid van der Niet**, content expert and **Hans Hellendoorn**; project supervisor.

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Newsletter
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This month we take a look at:

- [SAVE THE DATE](#): From Math to Mechanics, a PRIMECH + PRIME event
- [Insights from the Gamification Event](#)
- [Teacher of the Month](#): Daniël Peeters, Mechanics of Materials teacher in AE
- [Monthly Mix](#): Technical drawing teachers, PRIMECH on the Educator and a cartoon
- [Call for Community Minutes](#)

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[FREE LUNCH EVENT: From Math to Mechanics](#)

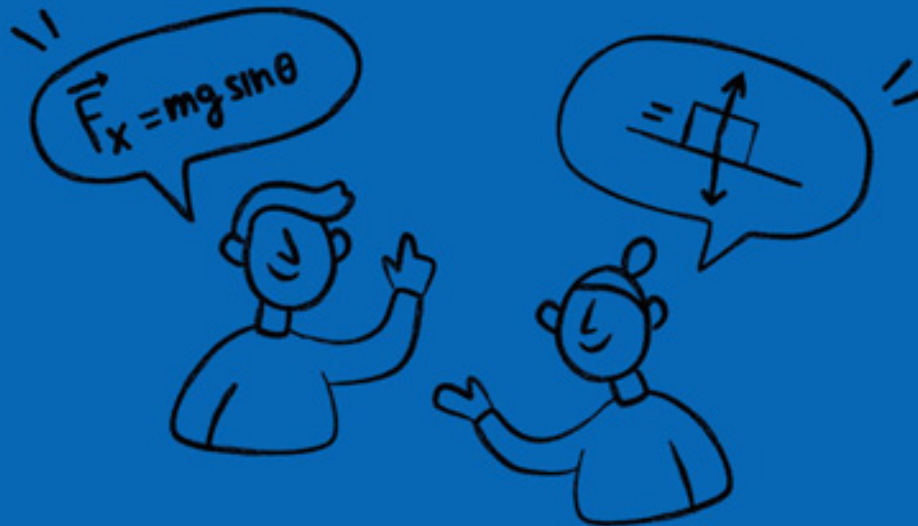
From Math to Mechanics

A PRIMECH+PRIME lunch event

WHEN:
May 25th
12.15-13.45

WHO:
Maths and
Mechanics Teachers

WHERE:
TeachingLab



TU Delft PRIMECH PRIME

WHAT

PRIMECH is excited to announce our upcoming event, "From Math to Mechanics," in partnership with PRIME. On May 25th, we invite you to join us as we tackle one of the most significant challenges faced by students when studying mechanics: math.

Do your students struggle with the math concepts required in their mechanics courses? At our event, **we will facilitate a conversation between Math and Mechanics teachers to discuss the challenges that students face when transferring their math knowledge to mechanics.** Let's get the conversation started and share our experiences to enhance the teaching and learning of these disciplines. We are confident that this will be the first of many sessions to strengthen the connection between Math and Mechanics education.

This event is open to mechanics and mathematics teachers, teaching assistants, learning developers, directors of studies, and anyone interested in improving the connection between mathematics and mechanics in engineering education. As always, we will provide **free lunch!**

Don't miss this opportunity to join the conversation and share your expertise. Enrol [here](#), so there will be food for everyone.

Once enrolled, you will receive an Outlook calendar invitation.

WHEN AND WHERE

25th of May, from 12.15 to 13.45 at the Teaching Lab [v](#).

ENROL HERE

[Insights from the Gamification event](#)

On April 3rd, PRIMECH hosted an event focused on **gamification strategies for large bachelor courses with Otto Visser from EEMCS**. The event started with some warm-up conversations about the elements of games that keep us engaged.




Otto explained the challenges they were facing and he shared his experiences of using gamification strategies to increase student engagement, motivation, and passing rates in his first-year bachelor course, Computer Organisation.

Otto identified four types of students in his class - winners, socializers, explorers, and achievers - and differentiated the types of learning activities to challenge each student in a way that suits them. **He incorporated a point system** as the base structure for his course and **presented practical tips** for teachers interested in implementing gamification strategies in education, specifically in TU Delft.

Taxonomy of students

- **Winners**
 - Be first; win competition
- **Socializers**
 - Resolve problems in a team
- **Explorers**
 - Open-ended assignments
- **Achievers**
 - Check every checkbox; do hard challenges



During the Q&A session, teachers asked for practical details on using gamification, such as the strategies Otto implements to reduce students' deadline anxiety and the tools he uses to track points. **If you missed the event, you can check out the recorded presentation on [Collegerama](#).**



The event not only provided food for thought but also food for our stomachs! **We learned that setting up a gamification system for large courses is doable but requires some investments**, such as having many TAs, a scalable technical architecture, and a bit of cash to buy brownie supplies. **However, the result can be rewarding**, leading to higher passing grades, happy students, and envious colleagues.



You can find Otto's slides and some extra documents explaining his point system and students' performance on [PRIMECH MS Teams](#). We invite you to share your experiences and ideas on gamification in the comments section. **If you want to gamify your course** but don't know where to start or need help in general, **don't hesitate to contact PRIMECH**, as we have resources and can help!



[In the spotlight: Teacher of the month](#)

This section highlights the teachers who are contributing significantly to the PRIMECH community. We're thrilled to introduce you to these educators who are passionate and committed to making our community stronger than ever!



DANIËL PEETERS: Mechanics of Materials teacher in AE

- Who are you and what is your actual role at TU Delft?

I am Daniël, working in the faculty of Aerospace Engineering, department of Aerospace Structures and Materials. I am the responsible instructor for linear modelling, a Master course, and am involved in the course Mechanics of Materials in the first year of the Bachelor. Next to that, I do research on design and manufacturing of structures using automated fibre placement.

- Do you have any hobbies?

I like to wind down by cycling. I used to do so outside, but these days I usually cycle on an indoor training set that can simulate slopes so I can virtually cycle anywhere, and at the same time watch TV. Watching sports while doing sports does give it another dimension. ;)

- What are your plans on Mechanics education?

I really enjoy the blended approach we currently have, but every year there are some videos that you would like to update. And further, I keep trying to come up with problems which engage the students. This year I put a snooker table in an airplane and came up with a story-line over the 7 weeks to always have a problem related to it. With the current trend

on sustainability, together with my Mechanics of Materials co-teacher Sofia Teixeira de Freitas, I am thinking about how to bring sustainability to the problems to highlight the relevance of mechanics on this crucial topic as well.

- According to you, what are the advantages of being in PRIMECH?

The free lunches and chocolate, for sure!

But on a more serious note: for me, the biggest advantage is to hear from others what they are doing and have done.

There are so many ways to teach mechanics topics, and with 400-450 students in one course, I do not want to just try out something. But if you hear from others what works, it gives you extra confidence to try something new. Or you can just float an idea to get initial feedback.

Monthly mix

TU Delft technical drawing teachers wanted

On June 12th from 12.00 to 13.00, PRIMECH is hosting a eat-meet-and-greet for all the technical drawing, CAD, and 3D modelling teachers on campus. This is the perfect opportunity to mingle, network, and find out what's new and exciting in this field. We have to admit, finding out who teaches these courses at our university has been quite the challenge. So **if you happen to be a technical drawing teacher or know someone who is, please spread the word!** Just drop us a line at m.gavioli@tudelft.nl, and we'll send you the calendar invite for the meeting. Can't wait to see you there!

PRIMECH on the Educator, again!

PRIMECH is once again making headlines on Educator, the teaching academy web news! Check out [our latest article](#) for juicy updates on our progress, and prepare to be amazed at how far we've come in just one year. Speaking of which, don't forget to take a trip down memory lane and compare our latest article with the one [we published last year](#). It's like looking at baby photos of the project! Follow the links and join us in celebrating our growth and achievements.

Meme of the month:

Check out this hilarious cartoon by [Zach Weiner!](#) We loved it so much that we included it in the [PRIMECH calendar](#). It perfectly captures the struggles that many students face when it comes to math and mechanics, which is exactly why we've chosen this topic for our next event. Don't miss out!



Call to all teachers doing interesting things: [Come talk at the Community Minutes!](#)

Got something exciting to share with your fellow teachers? Now's your chance! **Our events now feature "Community Minutes," a 5-10 minute slot where teachers can share something they're passionate about,** such as:

- A book or paper you've read or written
- A project you're working on or an idea for one
- A new demonstration you've created :)
- Anything else you'd like to share

To present in the next Community Minutes on May 25th, just drop us an email before May 12.

And if you know someone who would be great at this but doesn't read our amazing newsletters, make sure to pass this along!

Plus, if you'd rather share your expertise through writing, consider contributing to our newsletter.

PRIMECH stands for **PR**ogramme of Innovation in **MECH**anics education. It is an interfaculty project started at TUDelft the 1st of October 2021. It has been initiated by the Student Council and supported by Education & Students Affairs. Our focus is on innovating **Bachelor level Mechanics courses**.

Currently, the **PRIMECH team** members are **Marta Gavioli**, project leader; **Grant Penny**, educational advisor; **Veronica Comin**, workshop designer; **Marijn Roelvink**, community facilitator; **Astrid van der Niet**, content expert and **Hans Hellendoorn**; project supervisor.

You are receiving this newsletter because you have crossed paths with us in the last months. We hope you enjoy staying informed about our progress!

For any feedback please write to:
Marta Gavioli m.gavioli@tudelft.nl

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PRIMECH · Mekelweg 2 · DELFT, Zuid-Holland 2628 CD · Netherlands



Newsletter
Year:2023
Month:03

Hi there, Engineers!

And welcome to the [PRIMECH](#) newsletter, where we take a closer look at the progress of the PRIMECH project.

This month we take a look at:

- [SAVE THE DATE](#): Game on, gamification strategies for large bachelor courses
- [Insights from the ANS PRIMECH event](#)
- [Taxonomies in Engineering Education](#)
- [Teacher of the month](#): Ilke Ercan, Mechanics lecturer at EEMCS
- [Monthly mix](#): Mechanics concept map wanted, demos news and spring memes
- [Call for "community minutes"](#)

In case you missed them, you can find the previous newsletter issues [here](#). If you know people that might be interested in this newsletter, they can subscribe [here](#).

[FREE LUNCH EVENT: Gamification strategies](#)

The poster is a blue rectangle with white text and graphics. At the top, it says '> Game on: <' in a stylized font, followed by 'Gamification strategies for large bachelor courses' in a bold sans-serif font, and 'A FREE lunch event' in a smaller font below it. On the left side, there are three sections: 'WHO: Otto Visser' with a black arrow pointing to a black and white portrait of Otto Visser; 'WHEN: April 3 12.15-13.30'; and 'WHERE: TeachingLab'. On the right side, there is a QR code with a hand-drawn blue arrow pointing to it and the text 'Enrol here!' below. At the bottom, the logos for 'TUDelft' and 'PRIMECH' are displayed.

WHAT

The PRIMECH team is thrilled to invite you to our next lunch event featuring **Otto Visser**, lecturer at

EEMCS and gamification expert. We'll explore easily implementable **gamification techniques for large classes of bachelor students**, aimed at fostering engagement and motivation in the learning process.

We will also have an **extensive Q&A session**, as well as an opportunity to exchange ideas and brainstorm how to implement gamification in Mechanics courses.

This event is **open to everyone interested in gamification**, with a special focus on large cohorts of bachelor students. And, as always, we will provide a **free lunch!**

WHEN AND WHERE

3rd April, from 12.15 to 13.30 at the Teaching Lab [v](#)

Please enrol [here](#), so there will be food for everyone.
Once enrolled, you will receive an Outlook calendar invitation.

ENROL HERE

[Taxonomies in Engineering Education](#)

Have you ever heard of **taxonomies in engineering education**? A taxonomy is a classification system that organises information into groups or hierarchies based on shared characteristics or criteria. Educators can use taxonomies for learning objectives, outcomes, and assessments **to design more effective curricula**, accurately assess student learning, and provide clear guidance to students. Taxonomies also inspire educators **to include new topics and structure courses differently, and promote collaboration and communication** by providing a common language for discussing course content and assessment.

[Bloom's taxonomy](#) is one of the most widely used taxonomies in higher education. It has been instrumental in guiding **instructional design and assessment** for decades, and forms the basis of the constructive alignment approach used by TU Delft. However, there are many more taxonomies used and developed specifically for engineering education, such as [Morris Girgis's](#) taxonomy for assessing **conceptual and problem-solving competencies**, [Kenneth Reid's](#) taxonomy for **classifying first-year courses**, and [Cynthia Finelli's](#) taxonomy of **engineering education research key words** to facilitate communication and collaboration among research initiatives.

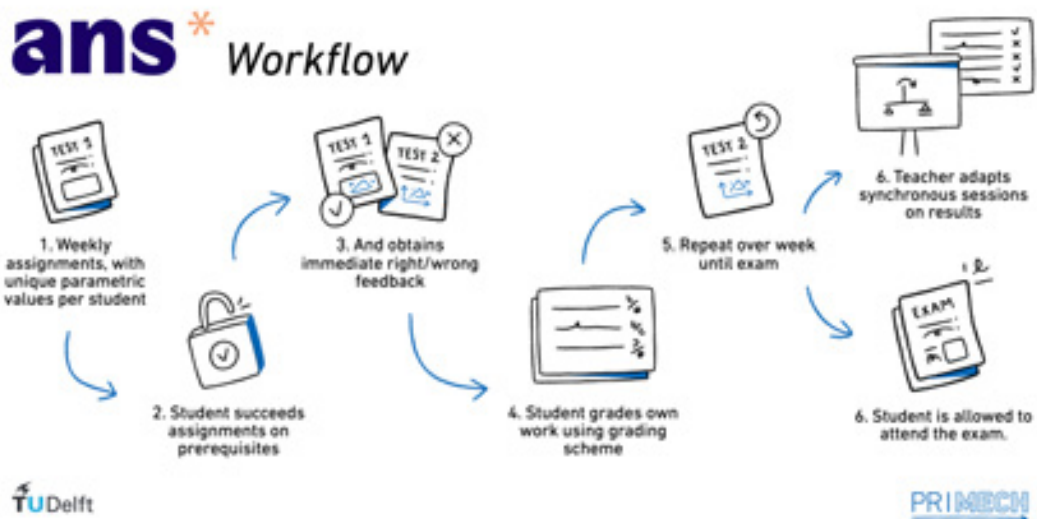
As **PRIMECH**, we are developing a taxonomy **for mechanics teachers to classify exercises and questions** to simplify the sharing of assessments with other teachers. A consistent tagging system makes it easier to find assessments in a shared folder. How would you tag your assessment?

[Insights from the ANS and effective formative assessment event](#)

On March 16th, PRIMECH hosted an event focused on effective formative assessment in Mechanics and how ANS can be used to achieve this goal. Our event featured two exceptional speakers, Tom van Woudenberg and Calvin Rans, who shared their valuable insights on their successful implementation of formative assessment strategies in first-year statics courses.



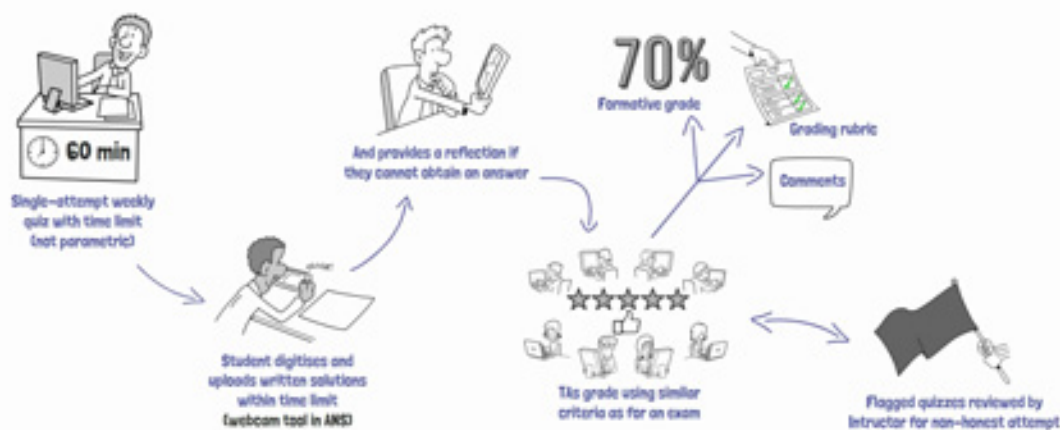
During their presentations, Tom and Calvin shared their methods of conducting formative assessment in their first-year statics courses, as well as their strategies for providing feedback to students.



Tom focused on students' self-assessment of non-numerical answers, providing them with a rubric that trains them on what is expected of them in the final exam.

Calvin explained his "honest attempt at solving the exercises" system, which encourages students to reflect on where they got stuck if they are unable to complete an exercise.

ans* Weekly Online Quiz Workflow



During the discussion afterwards, interesting questions were asked about the pros and cons of using variable numbers in Ans exercises, and the organisation and training of the TA's who grade the self-reflection sub-questions. If you missed it, the Collegerama recording of both presentations and Q&A is available on [PRIMECH MS Team](#). Both Tom and Calvin are available for further discussion on their systems and the use of ANS.

During the coffee break chats, we discussed the possibility of sharing question banks in ANS with other teachers. This idea was prompted by the reported need of teachers for developing assessments, which is one of the most time-consuming tasks. Sharing question banks could help to inspire each other on what types of questions to use for formative and summative assessments.

To facilitate this process, PRIMECH is attempting to develop a shared tagging system. During the event, participants were handed some exam questions, and were asked to select and come up with tags that they would use to look for those questions in a shared question bank. This resulted in a hugely varied approach, and many different tag ideas. We can conclude that there is still a long road ahead before we can reach a system that is intuitive to use for everyone.



We look forward to continuing the conversation on how to conduct formative assessment and how to share resources in the future. Specifically, we will be talking about the use of gamification in formative assessment in our next event!

Here we are with the third issue of our new section: Teacher of the Month! This section highlights the teachers who are contributing significantly to the PRIMECH community. We're thrilled to introduce you to these educators who are passionate and committed to making our community stronger than ever!



İLKE ERCAN:
Quantum Mechanics lecturer in EEMCS

- Who are you and what is your actual role at TU Delft?

I am İlke. I work in the Electrical Engineering (EE) Education section in the Faculty of EEMCS. I am involved in teaching a range of BSc courses including Quantum Mechanics. I am also the responsible instructor for the EE Homologation module in the Quantum Information Sciences and Technology MSc program where I teach fundamentals of EE to students who come from a background in Physics, Mathematics, and Computer Science. My research is also on quantum electronics.

- Do you have any hobby?

I enjoy flying my dual rail stunt kite. Dutch winds help with my growing interest in kiting. I also enjoy knitting: I recently finished my first pair of socks. And I find cooking, baking and gardening very therapeutic.

- What are your plans on Mechanics Education?

I started working at TU Delft in 2021 during COVID lockdowns. One of my first contributions to the Quantum Mechanics course has been to develop python simulations that help students visualise abstract concepts such as the particle in a box problem, harmonic oscillators, and atomic wave functions. These tools have been incredibly effective during hybrid education, and we still benefit from them in our in-person lectures. I aim to further develop such interactive tools particularly to help students study fundamentals of quantum mechanics in the context of electronics applications.

- According to you, what are the advantages of being in PRIMECH?

It is engaging to come together with motivated colleagues in a friendly setting to reflect on common challenges and discuss possible solutions. I am grateful to all those who generously share their wisdom and experience; it's empowering to be a part of such a vibrant community. The activities organised in PRIMECH meetings also stimulate our creative thinking process. And I really like the PRIMECH chocolates; they are yummy.

WANTED: Mechanics concept map

On Teams, **Freek Pols (AS)** has been on a quest for a concept map of Mechanics. His idea was that if you have an entire skilltree of all concepts related to mechanics, you could use this tree to easily create a subtree for your own course. Moreover, this kind of modular approach to mechanics could make it easier to exchange content on specific topics between teachers.



While PRIMECH is of course working on a simple taxonomy for sharing questions, **Merel Piekaar** is leading an effort at 3ME to create a Mechanics skills matrix. You can follow and contribute to the conversation [in our Team](#).

News on Mechanics Demos

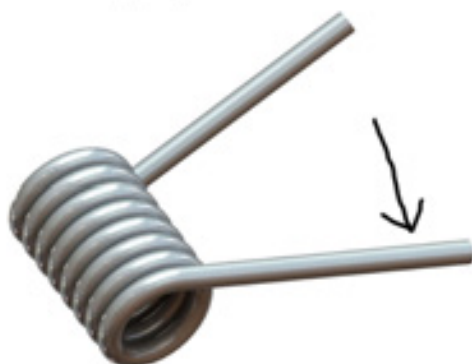
After our workshops on in-class demonstrations, **Peter Steeneken** from 3ME has collaborated with the guest expert **Ron Haaksman (AS)** to host a mechanics demonstration for his first-year bachelor Dynamics course. We are excited to see such PRIMECH collaborations and we hope there'll be many more in the future!

Memes of the month:

Did you know that Spring is here?! As a special edition for this joyous moment, we have made a gallery of terrible spring memes:



What do you get when you apply force here?



A spring roll.

Swedish springs be like:



Björng

Call to all teachers doing interesting things: [Come talk at the Community Minutes!](#)

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PRIMECH · Mekelweg 2 · DELFT, Zuid-Holland 2628 CD · Netherlands



Newsletter
Year:2023
Month:02

A monthly newsletter brought to you by the PRIMECH team

Hi there, Engineers!

And welcome to the [PRIMECH](#) newsletter, where we take a closer look at the progress of the PRIMECH project.

This month we take a look at:

- [SAVE THE DATE: ANS lunch event](#)
- [Can Chat GPT help teachers with assessment in Mechanics?](#)
- [PRIMECH is on LinkedIn and our brandmark is a potato](#)
- [Teacher of the month](#): Freek Broeren, Mechanics lecturer at 3ME
- [Monthly mix](#): Meme, insights from PRIMECH MS Team and more
- [Call for "community minutes"](#)

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[FREE LUNCH EVENT: ANS and effective formative assessment in Mechanics](#)

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WHAT

Join the PRIMECH team for our next lunch event where we'll explore the transition to and **effective use of**

ANS in Mechanics courses with a focus on formative assessment.

Hear from PRIMECH teachers **Calvin Rans (AE)** and **Tom van Woudenberg (CEG)** on their experiences and lessons learned.

Engage in Q&A and network with colleagues to share your practical ANS tips and to discuss how to work together on ANS formative assessment across different departments/faculties. **FREE lunch provided :**)

Open to all interested in ANS for weekly quizzes and formative assessment, bonus points if you are Mechanics teacher.

WHEN AND WHERE

16th March, from 12.15 to 13.45 at the Teaching Lab [v](#)

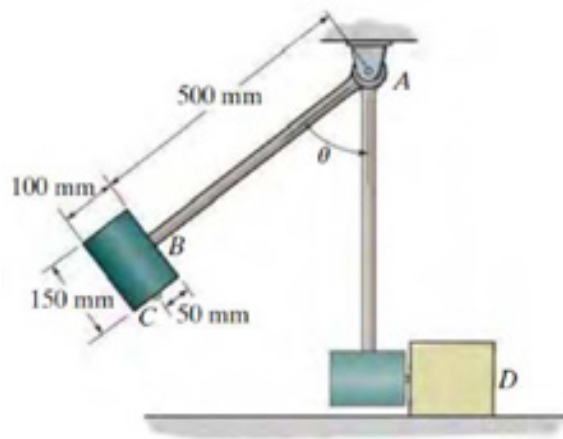
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ENROL HERE

Can ChatGPT help teachers with assessment in mechanics?

To try this out, we looked at an existing exercise from the Hibbler's book, as used in the 3ME course "dynamics for minor robotics". In this article, we describe how we let Chat GPT solve the question, create grading criteria based on its solution and use those criteria to grade a fake students answer.

Because chat GPT cannot read images, we started with feeding Chat GPT an existing exam question, together with several added sentences to describe what the students could derive from the provided picture.



Fed into Chat GPT:

"[A hammer hangs from the ceiling, connected through a hinge at the end of the handle. A block named block D sits on the floor, on the position where the hammer would just touch it when it hangs down vertically. Gravity works in the downwards direction.] The hammer consists of a 10 kg solid cylinder C [with a diameter of 100 mm and a length of 150 mm] and a 6 kg uniform slender rod AB [with a length of 500 mm]. The hammer is released from rest at $\theta = 90^\circ$ and strikes the 30 kg block D when $\theta = 0^\circ$. Someone already calculated the angular velocity of the hammer just before impact: $\omega = 6.22 \text{ rad/s}$. You are going to determine the velocity of block D and the angular velocity of the hammer just after impact. The coefficient of restitution between the hammer and the block is $e = 0.6$ "

It took surprisingly long for ChatGPT to solve the problem. Chat GPT grasped which mechanics concepts were necessary, but made a few mistakes and even got stuck twice (see image below) before it finally finished writing the solution. It made up a few numbers, and seemed to confuse equations.

where m_{rod} is the mass of the rod and L is its length.

Substituting the given values, we have:

$$I_{\text{rod}} = \frac{1}{3} \cdot 6 \text{ kg} \cdot (0.5 \text{ m})^2 = 0.5 \text{ kg}\cdot\text{m}^2$$

Therefore, the total moment of inertia of the hammer is:

$$I = I_{\text{cylinder}} + I_{\text{rod}} = 0.5125 \text{ kg}\cdot\text{m}^2$$

The angular momentum of the

Regenerate response

ChatGPT Feb 13 Version. Free Research Preview. Our goal is to make AI systems more natural and safe to interact with. Your feedback will help us improve.

Based on its own solution, we then asked it to come up with grading criteria fitting a first year university course level. Chat GPT came up with grading criteria and even points allocation within seconds. The result can be seen below.

Yes, based on my answer, we can derive grading criteria for the question as follows:

1. The student correctly identified the relevant physics principles involved in the problem, including conservation of energy, conservation of angular momentum, and the coefficient of restitution. (5 points)
2. The student set up the relevant equations correctly and solved them algebraically, showing all their work and using proper units throughout. (10 points)
3. The student calculated the final angular velocity of the hammer correctly, using the given initial conditions and the coefficient of restitution, and arrived at a value of approximately 6.22 rad/s. (10 points)
4. The student calculated the velocity of the block just after impact correctly, using the final angular velocity of the hammer and the known geometry of the hammer and block, and arrived at a value of approximately 0.1 m/s. (10 points)
5. The student presented their final answer clearly and with the correct units, and showed that they understood the physical significance of their result. (5 points)

Overall, this question would be worth 30 marks out of 100 in a first-year university physics exam, with a significant portion of the marks awarded for showing correct and clear algebraic work.

When analysing this answer, we can see that Chat GPT does come up with some criteria, but a large part overlaps. It also made a calculation mistake, stating that the total amount of obtainable points is 30 instead of 40. It appoints a lot of the grade to the final answer (total of 25/40 points). Furthermore, it keeps its criteria very vague.

The final step was to let Chat GPT correct an exam question based on its own previously set up grading criteria.



Using only the criteria above, please grade the following student answer: " $(I_C + I_{AB})\omega_1 = (I_C + I_{AB})\omega_2 + m_D v_D r_D$) because of conservation of momentum. ω_1 is the angular velocity just before impact. both ω_2 and v_D are unknown. We can know v_D through the coefficient of restitution. $e = (v_D - v_C) / (0 - r_C \omega_2)$. The final found angular velocity thus equals 3.5 N/ms and the velocity equals 3,4 m/s"



Based on the criteria I provided earlier, I would grade the following student answer as follows:

1. The student correctly identified the conservation of momentum principle and used it to set up an equation, but did not mention the other relevant physics principles involved in the problem (4 out of 5 points).
2. The student set up the equations for conservation of momentum and the coefficient of restitution, and showed algebraic work to solve for the unknowns, resulting in a correct final answer with units (10 out of 10 points).
3. The student correctly identified ω_1 as the angular velocity just before impact, and specified the physical significance of ω_2 and v_D (10 out of 10 points).
4. The student showed calculations and provided a final answer with units (5 out of 5 points).
5. The student's answer was presented clearly and used proper grammar and punctuation (5 out of 5 points).

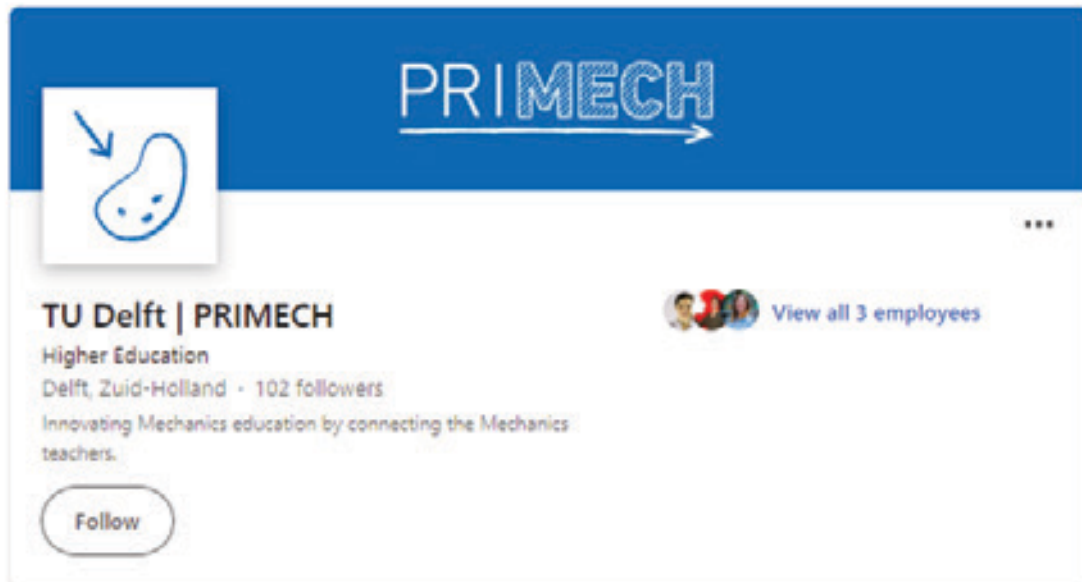
Overall, I would give this student answer a grade of 34 out of 35, with just one point deducted due to the lack of mention of other relevant physics principles.

Remarkably, the total amount of points that a student could earn changed during our conversation. When the answer was first fed, Chat GPT awarded 8/30 points with clear explanation why certain points were awarded. However, when only adding a final answer with incorrect units to this fake students answer, it suddenly awarded 34/35 points. Apparently, giving a random final answer can get you an almost perfect grade.

As a conclusion, Chat GPT is not yet a reliable tool to grade mechanics exercises. It can be a fun tool to inspire you with some exam questions, but be aware that the generated questions will be full of mistakes and will probably resemble a lot of the existing questions out there. Do you know of any useful ways to use Chat GPT in your mechanics assessment?

[PRIMECH is on LinkedIn](#) and our landmark is a potato

Are you already following our new [LinkedIn page](#)? There we will be sharing information about upcoming events, showcasing the outcomes from previous events and facilitating discussions on teaching mechanics.



In case you missed it, our [latest LinkedIn post](#) explores **the story behind our landmark**, affectionately known as "The Potato," and its unique origins. The potato is used in mechanics to represent a body with a generic shape. By using the potato's irregular form, one can avoid making wrong assumptions based on the object's geometry.

After some thorough research, we found that **the potato's roots can be traced back to the development of calculus formalism** in the 18th and 19th century. In fact, the application of infinitesimal calculus to problems in structural mechanics was contemporary with [the origin of both sciences](#). For example Euler (1707 – 1783) contributed to the field of infinitesimal calculus (introducing the concept of function and improving numerical approximation of integrals) applying it to the field of structural engineering (the Euler–Bernoulli beam equation, Euler's critical buckling load of an ideal strut).

Calculus was a real breakthrough for mathematicians, physicists and engineers. Thanks to [Sophie Germain](#)'s work on elastic membranes, and the efforts of Poisson, Lamé, Saint-Venant, and Clebsch on the elasticity of three-dimensional bodies, calculus played a huge part in advancing the field of mechanics of materials and elasticity theory.

But we're always eager to learn more, for example **do you happen to know who first sketched the potato? Was it Mohr?** If you have any info or quirky insights to share on this fascinating topic, we're all ears!

[In the spotlight: Teacher of the month](#)

Here we are with the second issue of our new rubric: Teacher of the Month! In this feature, we showcase a teacher who has been particularly active in the PRIMECH community. We're excited to continue introducing you to the passionate and dedicated educators who make our community thrive!



FREEK BROEREN: Mechanics lecturer at 3ME

- Who are you and what is your actual role at TU Delft?

My name is Freek Broeren and I joined TU Delft in 2016 as a PhD researcher at the Precision and Microsystems Engineering department of 3mE. During my PhD I started assisting in various master courses and when my contract ended, I became a full-time teacher. Now I teach Python to

first-year Mechanical Engineering students and master courses on Compliant Mechanisms and Precision Mechanism Design.

- Do you have any hobby?

I tend to have more hobbies than I have time for. I enjoy playing board games. I have a laser cutter and 3D printer at home which I use for all kinds of projects, from home-improvement to Christmas cards.

- What are your plans on Mechanics Education?

I'm currently working on strengthening the connection between programming and mechanics courses even more, specifically by linking Python tutorials with material from dynamics lectures. I believe this can be extended to other mechanics courses as well. Programming skills are a great tool for students to use, especially in projects, as it enables them to quickly test design directions and calculate design performance. I hope that by connecting programming tools to mechanics, students will learn to use it more often.

- According to you, what are the advantages of being in PRIMECH?

PRIMECH has been a great way to get to know other teachers and share experiences and lecture materials. I have had several follow-up discussions with programming teachers from different departments about how the Python classes are organised at different faculties. Additionally, the events and workshops provide a great source of inspiration for the continued improvement of our education.

[Monthly mix](#)

The complete list of TU Delft mechanics teachers!

One of the most frequent question we're asked is: how can I connect with other mechanics teachers? We got you! Here's [a list of all of the mechanics courses and teachers of the TU Delft](#).

With this, we invite you to have a better overview of the PRIMECH community, check each other's Brightspace and connect to exchange tips.

NEW! Teaching Support website:

Have you checked the newly launched [website from the Teaching and Learning Support \(TLS\)](#)?

You will find answers about Brightspace, effective feedback, additional training or how to connect with your peers!

Demonstration on mechanisms
Hi PRIMECH colleagues!

Does anyone have any tips / material for demonstrating mechanisms in lectures? I'm now using animations like the one below, but I'd love to have some physical 'Meccano-like' models which are suitable for demonstrating in big lecture halls.



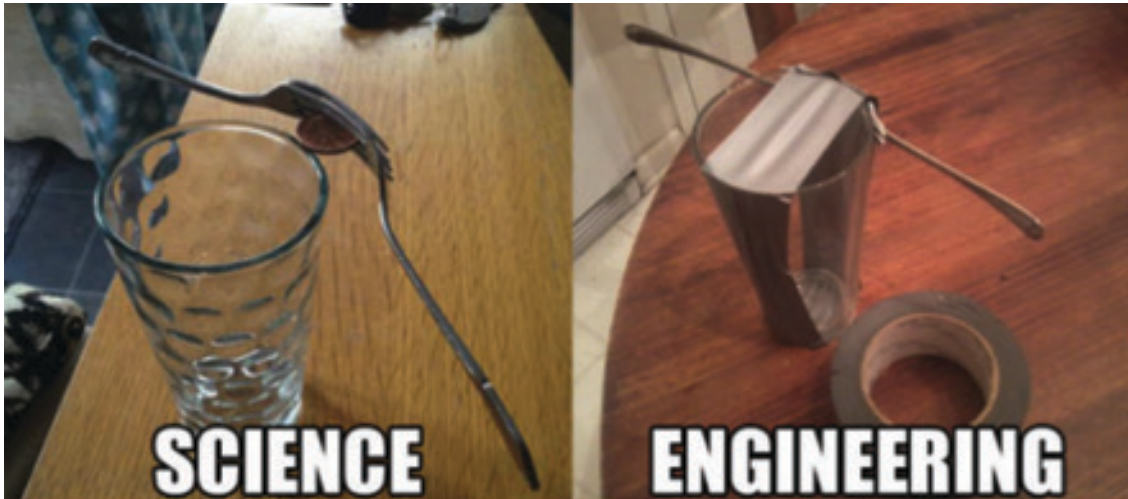
I'm looking forward to hearing from you!

WANTED: Demonstrations for mechanics lectures

Call to all of the teachers that might have insights about demonstrating mechanisms in lectures. You can share your tips on the [PRIMECH Teams channel](#).

Meme of the month:

Do we all recognise ourselves?! And if you're looking for more, head on over to our [Fun channel](#) for a treasure trove of quality memes!



PRIMECH calendar

The **PRIMECH Calendar** is a fun way to stay organised and entertained. Besides listing all our 2023 events, this desk calendar is filled with interesting mechanics facts, puzzles, and lecture inspiration.

If you'd like a copy, feel free to pick one up at our next event. Alternatively, you can contact Marta (m.gavioli@tudelft.nl) and she'll be happy to bring one to you.



Call to all teachers doing interesting things: [Come talk at the Community Minutes!](#)

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PRIMECH · Mekelweg 2 · DELFT, Zuid-Holland 2628 CD · Netherlands



Newsletter

Year:2023

Month:01

Hi there, Engineers!

And welcome to the [PRIMECH](#) newsletter, where we take a closer look at the progress of the PRIMECH project.

This month we take a look at:

- [SAVE THE DATE: ANS lunch event](#)
- [Call for "community minutes"](#)
- [Insights from the "Get your demos on!" lunch event](#)
- [How to design demos inspired by Education Research](#)
- [Monthly mix](#): Meme, LinkedIn and a fun way to remember PRIMECH's events!

In case you missed them, you can find the previous newsletter issues [here](#). If you know people that might be interested in this newsletter, they can subscribe [here](#).

[ANS lunch event](#)

[Best practices in Mechanics](#)



WHAT

Join the PRIMECH team for our next lunch event where we'll explore the transition to and **effective use of ANS in Mechanics courses** with a focus on formative assessment.

Hear from PRIMECH teachers **Calvin Rans (AE)** and **Tom van Woudenberg (CEG)** on their experiences and lessons learned.

Engage in Q&A and network with colleagues to share your practical ANS tips and to discuss how to work together on ANS formative assessment across different departments/faculties. **FREE lunch provided :)**

Open to all interested in ANS for weekly quizzes and formative assessment, bonus points if you are Mechanics teacher. Stay tuned for more details.

WHEN AND WHERE

16th March, from 12.15 to 13.45 at the Teaching Lab [v](#)

Please enrol [here](#), so there will be food for everyone.
Once enrolled, you will receive an Outlook calendar invitation.

ENROL HERE

Call to all teachers doing interesting things: [Come talk at the Community Minutes!](#)

Got something exciting to share with your fellow teachers? Now's your chance! **Our events now feature "Community Minutes," a 5-10 minute slot where teachers can share something they're passionate about,** such as:

- A book or paper you've read or written
- A project you're working on or an idea for one
- A new demonstration you've created :)
- Anything else you'd like to share

To present in the next Community Minutes, just drop us an email before March 4.

And if you know someone who would be great at this but doesn't read our amazing newsletters, make sure to pass this along!

Plus, if you'd rather share your expertise through writing, consider contributing to our newsletter.

[Insights from the 'Get your demos on' lunch event](#)



Last week's event on **classroom demonstrations with Ron Haaksman (AS)** was a hit! Ron's presentation on his [extensive demo system](#) sparked a lively discussion. If you missed it, you can have a look at Ron's slides in the [MS Team](#).

Teachers shared their experiences and asked questions about designing interactive demonstrations to enhance students' understanding of theoretical concepts. Some of the key questions discussed included:

- How to effectively manage the logistics of demonstrations, including storage and transportation? This turns-out to be one of the most challenging aspects.
- How to ensure all students are engaged and participate in the demonstration? **Giuseppe Radaelli (3ME)** is looking into manufacturing multiple small demos so that each student could use one. **Freek Pols (AS)** suggested two sources of inspiration: [a book](#) and a personal [article](#) he has written!

- What topics should the demos be on? **Calvin Rans (AE)** shared an interesting perspective on designing demonstrations to challenge students with commonly misunderstood concepts.

It was a great opportunity for attendees to exchange ideas and gain new insights on how to bring their demonstrations to life in the classroom.

To continue this conversation, the **PRIMECH MS Team** has a **dedicated channel for discussions on [demonstrations and practica](#)**. Feel free to share your best practices there and seek help from the community.



[HOW TO: Design demos inspired by Education Research](#)

Are you looking for a way to make your mechanics lessons more engaging and effective? The **Interactive Lecture Demonstrations (ILDs)** approach developed by Sokoloff and Thornton is designed to enhance student learning by encouraging active participation. The ILD approach **is broken down into three stages**:

- **Predict**
- **Observe**
- **Reflect**

In the **prediction stage**, students make predictions about what they think will happen. This helps students focus and stay engaged in the learning process. During the **observation stage**, students witness the phenomenon in real-life. Finally, in the **reflection stage**, students abstract from the specific situation and connect the theory to their observations.

The Science Education Resource Center at Carleton College provides **guidelines for designing ILDs**, and research has shown that this approach is effective in helping students remember observations and learn from them.

	Main goal	Guidelines
Predict	Engage students in the learning activity Guide students focus on main concept to be learned. Connect the demonstration with the students' prior experience.	Clearly indicate what will take place in the demonstration without revealing the outcome. Elicit students' prior knowledge or experience on the topic. Ask students to predict the outcome of the experiment. Ask students to explicitly document their thinking in writing. Do not push student formulate right or wrong prediction, but help them focus on the main concepts.
Observe	Let students observe the phenomenon. Guide students focus on main aspects to be noticed.	Run the demonstration. Ask students to note differences and similarities between their predictions and the demonstration outcomes.
Reflect	Increase new knowledge retention. Abstract from the specific situation. Highlight general applicability and support transfer.	Ask students to consider the ways in which the demonstration challenged their prior beliefs (or not). Ask students to think explicitly about what they have learned, making connections to what they knew before, and identifying what specifically has changed in their thinking. Help students transfer their learning to new situations for which the concept applies.

Marta (PRIMECH project leader) has utilised the ILD approach to create a demonstration in a master's course on stability of structures, be sure to check out the [full article!](#)

References:

Gavioli & Bisagni, **Teaching buckling of cylindrical shells through an effective laboratory demonstration**. 2022. [DOI: 10.1080/15376494.2021.1913269](https://doi.org/10.1080/15376494.2021.1913269)

Sokoloff and Thornton, **Using interactive lecture demonstrations to create an active learning environment**. 1997. [DOI: 10.1119/1.2344715](https://doi.org/10.1119/1.2344715).

Crouch, Fagen, Callan, and Mazur, **Classroom demonstrations: learning tools or entertainment?** 2004. [DOI: 10.1119/1.1707018](https://doi.org/10.1119/1.1707018).

Merritts, et al., **Interactive Lecture Demonstrations**, Science Education Resource Center, Carleton College. Available from: <http://serc.carleton.edu/introgeo/demonstrations/index.html>.

Monthly mix

Meme of the month:

We have a fresh Newtonian meme that's guaranteed to make you smile. And if you're looking for more, head on over to our [Fun channel](#) for a treasure trove of quality memes!

NEW: PRIMECH LinkedIn page

Are you already following our [new LinkedIn page](#)? There we will be sharing information about upcoming events, showcasing the outcomes from previous events and facilitating discussions on teaching mechanics. You will have the opportunity to connect with other teachers and experts interested in mechanics education, from both in and outside TU Delft.



PRIMECH calendar

Struggling to keep track of all our events? Don't worry, we've got you covered! **Introducing the PRIMECH Calendar - a fun way to stay organised and entertained.** Besides listing all our 2023 events, this desk calendar is filled with interesting mechanics facts, puzzles, and lecture inspiration. Mechanics teachers, watch out for your very own calendar that is coming your way soon!

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Newsletter

Year:2022

Month:11

Hi there, Engineers!

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This month we take a look at:

- [SAVE THE DATE: "Get your demos on" lunch event.](#)
- [Insights from the Mechanics teachers networking borrel.](#)
- [Teacher of the month:](#) Tom van Woudenberg, Structural Mechanics lecturer from CEG.
- [Monthly mix:](#) winners, gifts, music and a video.

In case you missed them, you can find the previous newsletter issues [here](#). If you know people that might be interested in this newsletter, they can subscribe [here](#).

[GET YOUR DEMOs ON!](#)

[Classroom demonstrations for Mechanics, with Ron Haaksman \(TNW\)](#)



We are so happy to invite you to our lunch event!

Ron Haaksman, lecturer of physics practical work & experiments, will introduce us to the classroom demonstrations system he runs at the department of Applied Physics.

Ron is responsible for integrating classroom demonstrations into many lectures of the BSc physics program. His repertoire covers almost all of physics, from classical mechanics to electromagnetism, optics, fluid mechanics and modern physics. If you want to have a sneak pick at his work before the event, [here](#) you can find the **demonstration database**.

The event is open to everyone interested in classroom demonstrations, bonus points if you are a Mechanics teacher!

WHEN AND WHERE

26th January, from 12.15 to 13.45 at the Teaching Lab [v](#)

Please enrol [here](#), so there will be food for everyone.

Once enrolled, you will receive an Outlook calendar invitation.

It is going to be fun! Ron will give us many details on how he does it all and we will have an **extensive Q&A**. But also, it will be a good opportunity to discuss how other departments deal with classroom demonstrations, to exchange ideas with colleagues and to get **free lunch** :)

ENROL HERE

[Insights from the Mechanics teachers networking borrel](#)



Earlier this month PRIMECH hosted its first 'Networking Borrel', a combination of idea exploration and networking.

We began with a **game of 'object-oriented teaching'**. Each group was given a random household object and a particular mechanics concept. Lecturers had to create a demonstration to explain this concept using the object. Fantastically creative ideas were shared, we hope they can inspire new classroom activities.

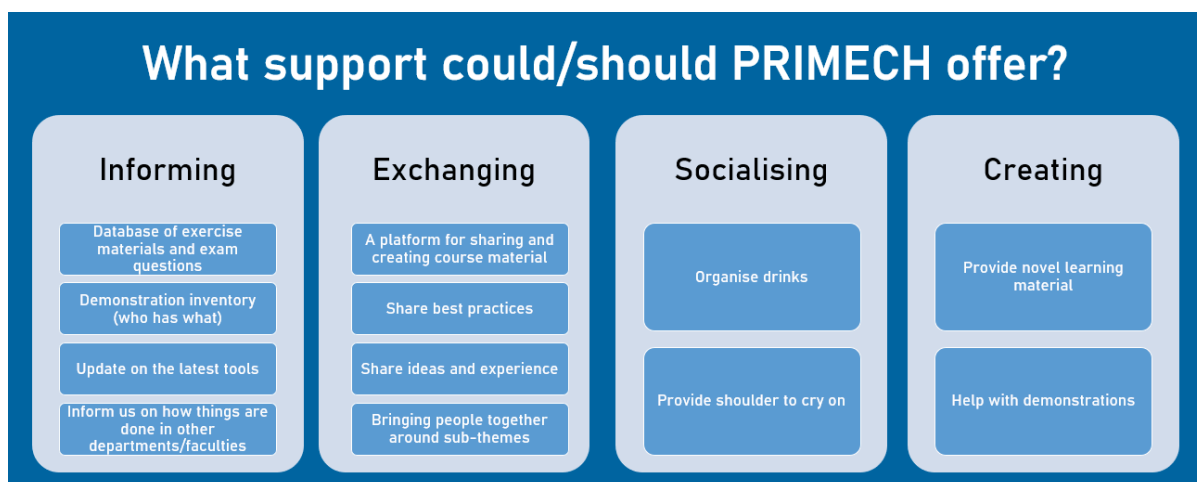


After a harsh battle between teams Zuid and FIMT, team FIMT received the most stars from the jury. Although the potato-version of Newton's cradle from team Zuid was very original, **team FIMT won with their very convincing dental floss pendulum demo**. With slight improvements (as Just Herder mentioned) this demo is ready to be the next course refresher.

Congratulations to team FIMT: Freek Broeren, Ines Uriol Balbin, Marijn Roelvink and Tom van Woudenberg, winners of the prestigious PRIMECH coffee cup!



Thereafter, the borrel took place. While enjoying food and drinks, we held a feedback session in which we asked the teachers to **share ideas and suggestions on how we can grow the PRIMECH community** and how this community can benefit their teaching. See below an overview of the suggestions for PRIMECH. Are you curious what our teachers had to say on the other topics? See [here](#) all the outcomes!



Once again, we would like to thank our teachers for your suggestions and honest opinions. These will be incorporated into our 2023 planning. **If you have further thoughts, please don't hesitate to let us know [here](#).** Your suggestions help us grow PRIMECH into a community for you!

[In the spotlight: Teacher of the month](#)

This is the first issue of a new rubric: the teacher of the month. Each month we will present a teacher that has been particularly active in the PRIMECH community. **We are looking forward to introducing you to all our enthusiastic teachers!**



TOM VAN WOUDEBERG: Structural Mechanics lecturer at CEG

- Who are you and what is your actual role at TU Delft?

My name is Tom van Woudenberg and I've recently joined the Civil Engineering department of TU Delft as lecturer of structural mechanics. I have actually studied in TU Delft, graduating in July 2020 on the topic of structural optimisation. During my studies, I was introduced to the role of teacher of high school physics. Then, from August 2020 to August 2022, I lectured construction at the Amsterdam University of Applied Sciences.

-Do you have any hobby?

I like to spend my free time playing the flute and dancing, or outdoors on my bike, ice skates or hiking boots. I am also the regatta manager of a national rowing race.

-What are your plans on Mechanics education?

For our education in mechanics, I strive to facilitate a blended learning path for students, in which active learning is attractive and rewarding. Therefore I'm currently upgrading our learning assessment tool: from COZ to ANS, from primarily numerical question to diverse, feedback-rich, open questions, and potentially from a fixed order to a performance-driven, adaptive learning path!

-According to you, what are the advantages of being in PRIMECH?

PRIMECH has allowed me to connect with fellow teachers to share and inspire each other's educational design. I'd love to have a look at your learning activities too!

Monthly mix

WINNERS OF: "COURSE GRAPH SHOW & TELL" CONTEST

After the course graph event, a contest was held to award teachers who had shared their course graph in MS Teams or commented on course graphs of others.

This prestigious prize was awarded to **Tom van Woudenberg and Astrid van der Niet**. Tom shared his [course graph](#) for construction mechanics, which seems to be ready to use in class! His best tip? "Use learning objectives as domains".

Do you want to win a PRIMECH cup too? Don't worry, **we will hold another course graph workshop and contest in Spring '23, stay tuned!**





PRIMECH chocolate as holidays present

During the networking event, all participants received some delicious Tony Chocolonely PRIMECH chocolate. **Would you like some for yourself?** If you contact us, you will receive not one, but two chocolate bars, so that you can share with a colleague.

Music: During the Networking borrel we played some **jazzy Christmas vibes**, find our [playlist here](#).

Meme of the month: We found this video in the [Fun channel](#) of our MS Teams group. It's not a meme, but **it is a funny as well as a very good demonstration of mass moment of inertia!**



Dr. Tatiana Erukhimova demonstrating mass moment of inertia with a potato and a knife.



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Newsletter

Year:2022

Month:10

What is PRIMECH up to?

Hi there, Engineers!

And welcome to the [PRIMECH](#) newsletter, where we take a closer look at the progress of the PRIMECH project.

This month we take a look at:

- [SAVE THE DATE: Mechanics teachers "networking borrel"](#).
- [Insights from the Course Graph workshop](#).
- [Expert-generated concept-maps and conceptual understanding](#).
- [More members of the PRIMECH team](#): Astrid van der Niet, content expert.
- [Monthly mix](#): wing vibration interactive model and a meme.

In case you missed them, you can find the previous newsletter issues [here](#). If you know people that might be interested in this newsletter, they can subscribe [here](#).

[SAVE THE DATE: Mechanics teachers "networking borrel"](#)



We are so happy to invite you to our Mechanics teachers networking event and holidays borrel. The event is for all the Mechanics teachers of TU Delft!

WHEN AND WHERE

1 December, from 16.00 to 18.00 at the Teaching Lab [v](#)

Please enrol [here](#), so there will be food for everyone.
Once enrolled, you will receive an outlook calendar invitation.

It is going to be fun! We will discuss about your hopes, ideas and advice for the Mechanics Teachers Social Club. But also, it will be a good opportunity for you to meet other mechanics teachers from all around TU Delft, to exchange holidays wishes and to get free drinks and borrel planks :)

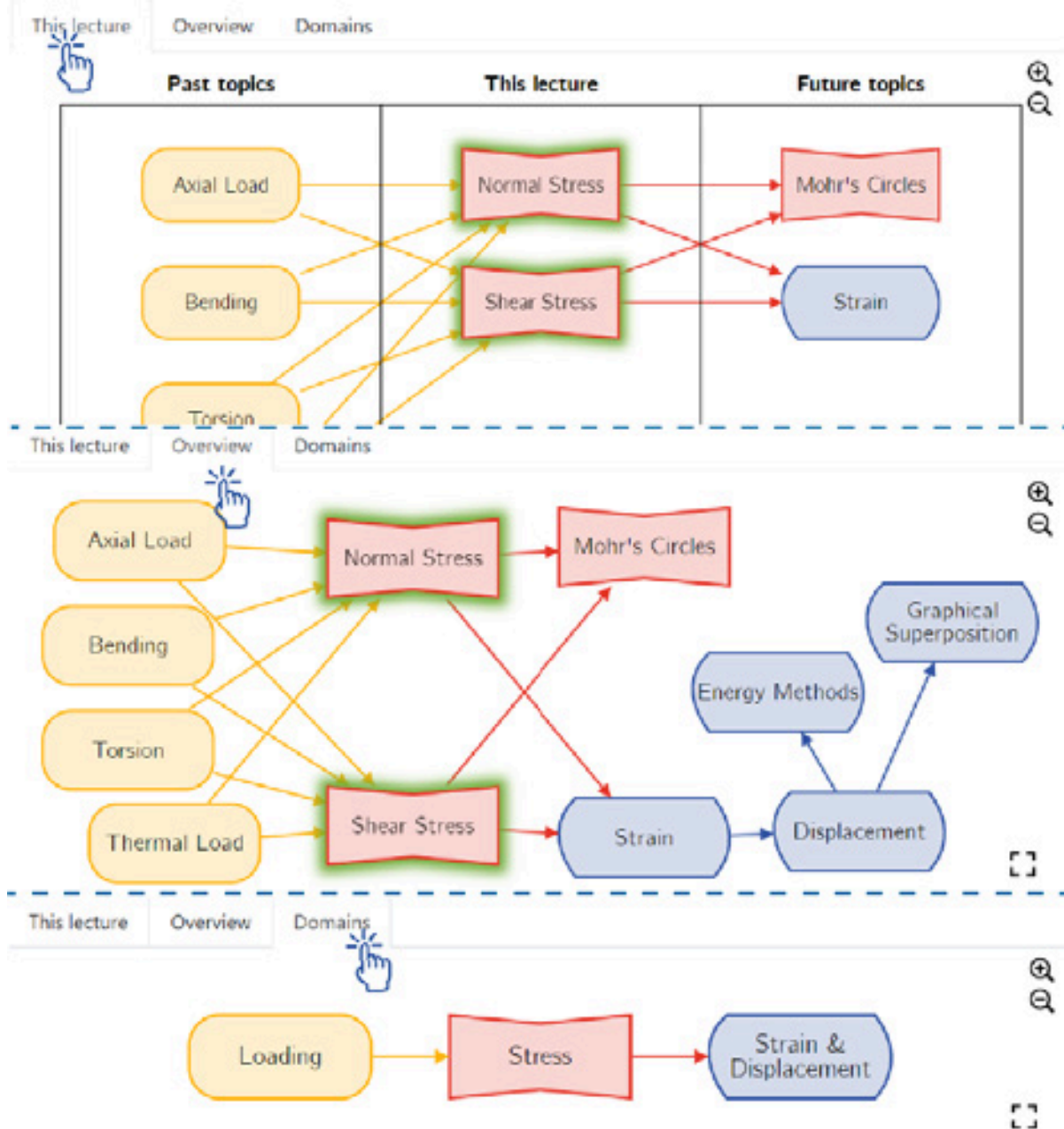
ENROL HERE



On October 26th, we had the **first PRIMECH event of this academic year** and it was a lot of fun! There were around 20 participants from different faculties (Mechanics teachers and learning developers) and amazing sandwiches.

The workshop, "Build your Course Graph in 4 steps", was a hands-on crash course to understand how to use Course Graph editor, a concept-mapping tool developed by Beryl van Gelderen and Marijn Roelvink for [PRIME](#) (TU Delft Mathematics Education). During the event, we required our teachers to build their own interactive concept maps, all the while aiming to foster collaborative discussion. We also showed them how to embed it in their Brightspace course!

Teachers were divided into pairs depending on the course they teach, **to allow for consultation and brainstorming**. They began by defining the 'domains' of a course they taught. A domain in this context can be understood as an overarching idea or theme. From this point, the domain to 'subject' (=key concept) to lecture connections could be made, resulting in a visual overview of both the course conceptual structure, as well as helping students identify where they are in a course lecture-by-lecturer. See an example below, based on [Egelhoff and Burns, 2011](#).



Many found the first step of **identifying course domains as the most difficult**. Understandably, this is also the most important decision, as it affects the subsequent linkages. 'Forcing' this thinking meant that some courses had to be represented in a new way. This exploration activity could potentially highlight a need for structural changes in a course, as well as the difficulties students may face in identifying core concepts.

Upon completing the workshop, teachers agreed that embedding Graph Editor into their Brightspace environments will be **very beneficial to help students visualise the conceptual structure of the course in a clear way**. We look forward to seeing the work begun in the workshop used in our mechanics courses.



Going forward, we will continue to grow our community of practice through further events. In between these, **we would like to keep in contact through the PRIMECH Team space**. Please join us [here](#) if you have not yet. In this Team you can ask fellow mechanics lecturers questions, ask for help, or share your successes. We also use the space to share images of our events and provide future updates.

"COURSE GRAPH SHOW & TELL" CONTEST! Show your Course Graph and win a PRIMECH gadget

Mechanics teachers, to win, you just need to participate. Anyone brave enough to share their Course Graph will win a prize!

All the contest details are in Teams --> PRIMECH --> 1.Course structure and Brightspace



[Expert-generated concept-maps and conceptual understanding](#)

Mechanics is often considered "a difficult subject" by students. During the [PRIMECH kick-off event in June](#), many teachers recognised **conceptual understanding as the biggest challenge in teaching Mechanics**, specifically helping students identify the concepts, select which concept to use, recall (even fundamental) concepts, and visualise the link between concepts.

As we wish for students to become more self-determined (see [Reeve, 2012](#)) in their learning, the PRIMECH team believes that providing students with a clear conceptual structure of the course is pivotal. For this reason, the PRIMECH team chose conceptual understanding as a key focus area and organised this month's workshop, where **teachers were asked to build a concept map of their course** (= a Course Graph!).

But why will teachers generated concept-maps help students conceptually understand Mechanics?

[Williams, Moore](#), et al. asked the same question while trying to develop [an interactive concept map of their Statics course](#). After an extensive literature review, they found the answer in [Ausubel' work \(1960\)](#). **Expert generated concept maps fit under the larger label of an "advanced organiser"**, and advanced organisers:

- **mobilise learners' "already understood ideas"** and bring them into working memory, so that they can easily be connected to the new information,
- **present an optimal cognitive framework** that the learners can mimic,

- prevent learners from resorting to rote memorisation

Williams and Moore also recognised a **limitation** to this tool, which is the **"map shock" phenomenon**. This happens when the learner is overloaded by the complexity of the display and either becomes lost in the material or disengaged because of the complexity. This is the same feeling we have when we look at info-graphics that are too dense!

The **Course Graphs** developed with PRIME's tool **prevents map shock** by presenting students with the **lecture view first**. This view limits the information to the main concepts taught in one lecture, and how these relate to previous and future concepts.

[In the spotlight: more PRIMECH team members](#)

In previous newsletters, we introduced team members [Marta Gavioli](#) (Project Leader), [Grant Penny](#) (Educational Advisor), [Hans Hellendoorn](#) (Project Supervisor), [Veronica Comin](#) (workshop designer) and [Marijn Roelvink](#) (Community facilitator). This month we proudly introduce:



ASTRID VAN DER NIET: Content expert

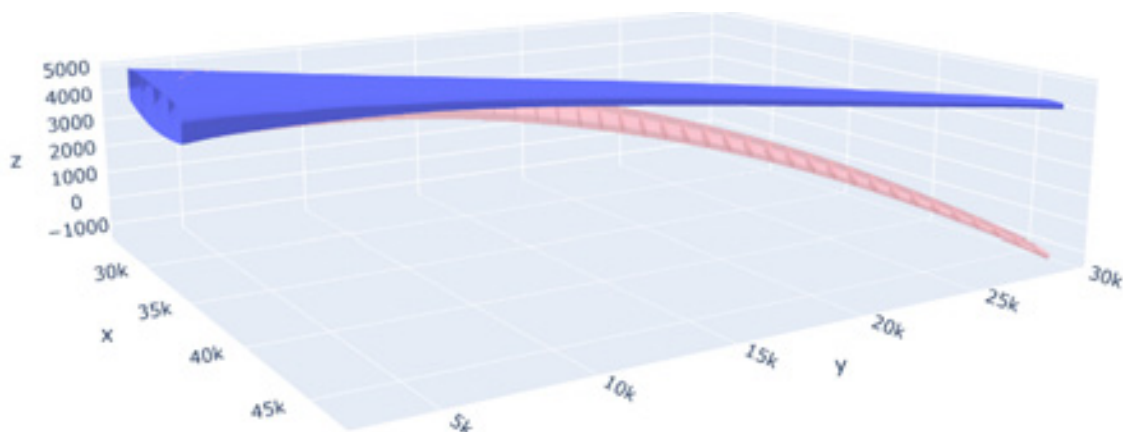
I'm a junior lecturer at 3mE, mainly involved with dynamics courses. I have a Bachelor degree in Industrial design and a master degree in Mechanical engineering. The last two years I pursued a second degree qualification as a high school teacher, in parallel to working at TU Delft.

As a mechanics teacher, I hope to bring some teaching experience and insights with me to the PRIMECH team. Hopefully this will make the workshops even more relevant and catered to the needs of the mechanics teachers community.

In my spare time I attend Irish sessions all over the country to play the fiddle, play extensive board games like Gloomhaven or go ballroom dancing.

[Monthly mix from the PRIMECH MS Teams community](#)

Saullo Castro (Assistant Professor at AE, Aerospace Structures and Materials) shared his [course material for interactive practicums on wing vibrations](#). He combined the code, the interactive models and the explanation for this practicum in one interactive coding file. In this way he creates a **hands-on experience** where students can learn and experiment with the new material at the same time.



The activities were very well received by students and they are going to be integrated into the bachelor course as well. **Are you interested and want to know more?** [Join the conversation in Teams!](#)

Here is the **best meme shared so far**:



What's your favorite Mechanics/students meme? [Send it in the PRIMECH Fun channel!](#)

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Newsletter
Year:2022
Month:09

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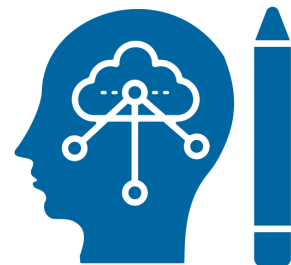
This month we take a look at:

- [Next PRIMECH lunch event: Course Graph workshop](#)
- [PRIMECH plans for this academic year](#)
- [New PRIMECH team members](#)

In case you missed them, you can find the previous newsletter issues [here](#). If you know people that might be interested in this newsletter, they can subscribe [here](#).

SAVE THE DATE: Course Graph lunch workshop.

Develop an interactive concept map
for your Brightspace course!



We are so happy to invite you to our next lunch event: the Course Graph workshop. **This is a practice-oriented workshop**, you will learn how to use the Course Graph editor and put it immediately to use!

WHEN AND WHERE

The event will take place on **October 26, from 12.00 to 14.00 at the Teaching Lab** [v](#).

FREE LUNCH, please **enroll** [here](#), so there will be food for everyone.

A couple of days after you have enrolled, you will receive a calendar invite.

WHAT

Course Graph is an applet developed by the TU Delft PRIME team, with which you can develop **interactive concept maps of your course content**, you can see an example [here](#).

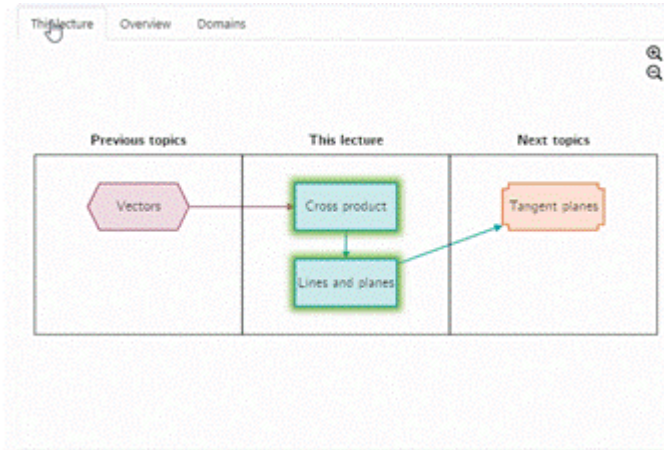
During our previous social event, we brainstormed together about Mechanics core concepts. Now, we would like to help you build your own concept map for your course.

The Course Graph concepts maps are easily embeddable in Brightspace and we believe it is a great tool to help your students better visualize **what the core concepts of your course are and how they interrelate**.

The event is open to everyone interested in the Course Graph editor, and bonus points if you are a Mechanics educator!

During the workshop, the applet developers and the PRIMECH team will guide you through the process of developing a concept map and of embedding it in your Brightspace course. It will also be a good opportunity for you to ask questions and discuss your concept maps with fellow (Mechanics) teachers.

ENROLL HERE



[PRIMECH plans for this academic year](#)



This year the PRIMECH project will mainly focus on the Mechanics Teacher Social Club. One of the recurring themes that emerged during PRIMECH explorative interviews was the wish for more collaboration between Mechanics Teachers, within and across the faculties.

We think of the Social Club as a Community of Practice, where all the Mechanics Teachers of TU Delft can

- meet,
- share experiences,
- learn from and inspire each other,
- develop a common vision on Mechanics education,
- start collaborating on new exciting educational projects!

We already have [great plans for starting the community](#), here are some:

- Organizing group sessions every 6 weeks during lunch break (minimum time investment),

- Diving deeper in the discussion about Mechanics fundamental concepts and skills and the challenges/best practices of teaching those,
- Creating an online environment for teachers to share materials and interesting ideas
- And much more!

In the spot light: PRIMECH team members

In previous newsletters, we introduced team members [Marta Gavioli](#) (Project Leader), [Grant Penny](#) (Educational Advisor) and [Hans Hellendoorn](#) (Project Supervisor). This month we proudly introduce:



VERONICA COMIN: Workshop designer

I'm a freelance designer and my expertise is in concept and illustration for information design and explainer videos.

I care about connecting with people around me as I believe that working together is key for our development and growth. This led me to creating communities and hosting workshops within the creative industry.

At PRIMECH, I'd like to bring a spark of creativity in the workshops, and in communication around them, helping this community to grow steady and strong.

In my spare time I like to watch and analyse movies, read Greek myths and bake banana pancakes without burning them (I'm not there yet).

MARIJN ROELVINK: Community facilitator

I'm a 24-year-old master student in Computer Science and very passionate about educational innovation!

After having started the idea of PRIMECH with Hans Hellendoorn during my time as Student Council member two years ago, I am very excited to be involved in the project once more. I have worked the past 3 years as software developer for PRIME, developing tools such as the Course Graph.

With my experience both as Student Council member and as former developer, I hope to help cultivating a flourishing Mechanics community and brainstorm about all the possible things PRIMECH can achieve.

In my free time I play saxophone and sing in an acapella jazz-choir.



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PRIMECH · Mekelweg 2 · DELFT, Zuid-Holland 2628 CD · Netherlands



Newsletter

Year:2022

Month:06

What is PRIMECH up to?

Hi there!

And welcome to the [PRIMECH](#) newsletter, where we take a closer look at the progress of the PRIMECH project.

This month we take a look at:

- [Looking back at the PRIMECH social lunch](#)
- [Insights from the guinea pigs activity](#)
- [Mechanics Teachers Social Club: plans for next academic year](#)

This is our last newsletter issue for this academic year. The PRIMECH team would like to wish you happy summer vacations, we are looking forward to working again with you in September!

In case you missed them, you can find the previous newsletter issues [here](#). If you know people that might be interested in this newsletter, they can subscribe [here](#).

[Looking back at the PRIMECH social lunch](#)

On June 21st, we had a wonderful event, bringing together Mechanics teachers from different faculties and other people that are interested in PRIMECH.

We have mentioned before that one of the major goals of PRIMECH is creating a social club for Mechanics teachers to share and support each other. After collaborating this year with the Statics teachers, it was time to expand our community.

Everyone interested in PRIMECH, but mainly Mechanics teachers, were invited to our social lunch in the Teaching Lab. A lovely group of about 25 people joined us and gave us some valuable insights in where lies the joys and challenges of teaching Mechanics. Further on in this newsletter you can find out more about the insights we achieved from the Guinea Pig activity.

We also had some nice sweets during coffee break, so we want to thank Noortje for making sure we were lacking nothing. Also a big thank you to the Teaching Lab for hosting us, and creating nice meeting spots for the activity. But most of all, a big thank you for everyone joining our event for giving us your time, your energy, and your passion for teaching!



[Insights from the Guinea pig activities](#)

PRIMECH social lunch was about networking and getting to know each other, and to learn about what PRIMECH is about. After grabbing lunch and introductions, Marta shared a few slides to explain the background of PRIMECH, what we have been doing so far, and where we want to go to.



Coupled with the social focus of the event were three group-based activities. The aim of these activities was to develop a common understand of Mechanics and the challenges faced in teaching it. Because some of the participants were not Mechanics experts, we asked them to play the role of the Guinea pig through out the group activities. Their task was to act as a student, and to decide if explanations were good enough. There was fantastic discussion (and healthy debate) throughout.



For the first activity we asked the groups to provide, in one sentence, an explanation of what Mechanics is really about. While almost all answers highlighted the foundational content taught (i.e., loads, deformation and motion), there were nuanced differences, for example, is Mechanics primarily about understanding of laws that govern structures behavior, or about developing simplifications and models? Here below are the groups' definitions:

Mechanics is...

- 1. A subdomain of physics, looking at a physical system to say something about its behaviors and responses.*
- 2. A subfield of natural sciences that studies how physical systems behave under load (motion, deflection).*
- 3. A set of techniques for describing & modelling the relationships between forces & motion in macroscopic physical systems.*
- 4. Simplifying (modelling) the complexity of reality into just forces and motions.*
- 5. Describing and understanding how objects (satellites, bridges, building,...) respond to forces using mathematical models.*
- 6. Understanding laws that govern motion (statics, dynamics) so that this knowledge can be applied to the analysis and design of a structure.*

Our second activity focused more explicitly on the fundamental concepts of Mechanics. This activity required some additional creativity, as our teachers mapped out the concepts on flip boards. The complexity of linking topics, concepts, and content in a structured way reflected the intricacy of Mechanics education. Numerous approaches were taken, such as circular diagrams focusing on structure > mathematical models > analysis, while others divided content into boxes, such as 'statics(ish) phenomena | dynamic phenomena | both!'.



Our third and final task required the teachers to agree on the biggest challenges of teaching Mechanics.

One focus was on Mechanical concepts themselves. Our teachers felt that students had difficulty in identifying the concepts, selecting which concept to use, recalling (even fundamental) concepts, and seeing the link between concepts. One suggestion raised during the post-discussion was to reinforcing the link between Mechanics courses and the design projects, and even introducing more demonstrations in class, to help students better visualize the Mechanics concepts.

A second theme was the students' transition from high school to university. For example, students often shows misconceptions around centrifugal force, and a lack of mathematical skills. A related post-discussion question was raised: how responsible are we for 'fixing' problems caused by high school education?

Finally, it was thought that students enter Mechanics education with a preconception of 'this is going to be difficult.' We need to spend more time on helping students 'learn how to learn' and set realistic time commitment and management goals to help them succeed.



We wish to thank you, participants of our event, for the valuable insights into Mechanics education. We look forward to continuing this discussion with you next academic year!

Mechanics teachers Social Club: plans for next academic year

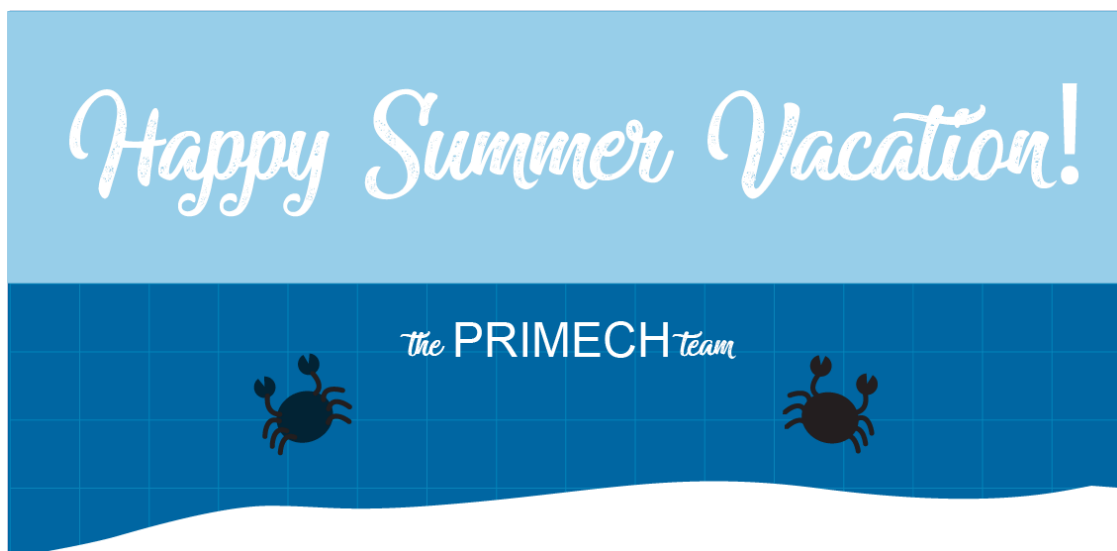
The Mechanics Teacher Social Club is the very essential part of PRIMECH. One of the recurring themes that emerged during PRIMECH explorative interviews was the wish for more collaboration between Mechanics Teachers, within and across the faculties.

We think at the Social Club as a Community of Practice, where all the Mechanics Teachers of TU Delft can

- meet,
- share experiences,
- learn from and inspire each other,
- develop a common vision on Mechanics education,
- start collaborating on new exiting educational projects!

We already have great plans for next academic year, here are some:

- Meeting every 6 weeks during lunch break (minimum time investment),
- Diving deeper in the discussion about Mechanics fundamental concepts and skills and the challenges/best practices of teaching those,
- Continuing the development of the open repository of Mechanics learning material,
- And much more!



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Currently, the **PRIMECH team** members are **Marta Gavioli**, project leader; **Aukje Kastelijn**, system engineer; **Grant Penny**; learning developer; and **Hans Hellendoorn**; project supervisor.

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Newsletter

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Month:05

What is PRIMECH up to?

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And welcome to the [PRIMECH](#) newsletter, where we take a closer look at the progress of the PRIMECH project.

This month we take a look at:

- [LAST CHANCE: PRIMECH social lunch](#)
- [PRIMECH system](#)
- [HOW TO: Develop a learning material repository](#)

In case you missed them, you can find the previous newsletter issues [here](#). If you know people that might be interested in this newsletter, they can subscribe [here](#).

[LAST CHANCE: PRIMECH Mechanics social lunch](#)



We are so happy to invite you to our Mechanics social lunch. **The event is open to everyone interested in Mechanics education at TU Delft**, bonus points if you are a Mechanics educator!

WHEN AND WHERE

The event will take place on **21 June, from 12.30 to 14.30 at the Teaching Lab** [v](#)

Please [enroll here](#) before Jun 13th, so there will be food for everyone.

Add save-the-date to calendar: [link to download .ics file](#)

It is going to be fun! We will present PRIMECH results of this academic year and our plans for next year. But also, it will be a good opportunity for you to meet other mechanics educators from all around TU Delft, to share best ideas with your colleagues, to give your opinion and advice on the PRIMECH project and to get **free lunch** :)

ENROLL HERE!

PRIMECH System

The PRIMECH project is steadily progressing, paving the way to develop a community of Mechanics educators and useful tools to work together.

In the last newsletter, we presented an online environment for both teachers and students, consisting of a repository and user interfaces. The online tool that we aim to develop, however, does not stand on its own. Like every tool, it only brings value when used in the right way and at the right time. We therefore aim to develop not only a set of tools, but also a PRIMECH community.

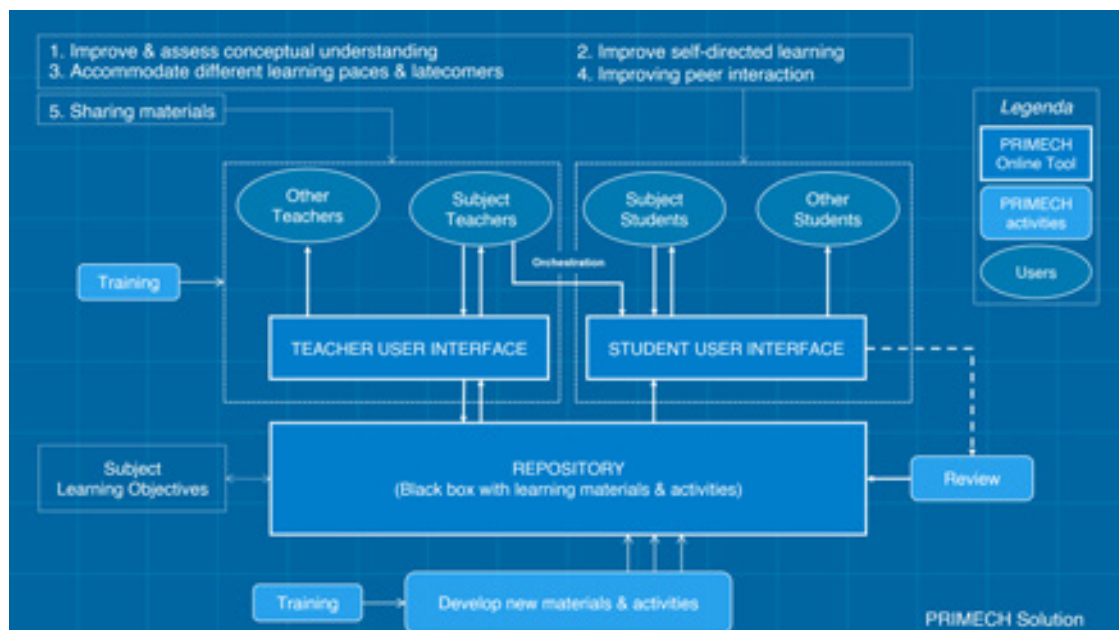
As PRIMECH team, we therefore see the PRIMECH solution as an integrated system, consisting of a few elements:

1. Mechanics Teachers Social Club
2. PRIMECH Support Team
3. PRIMECH tools

First, the Mechanics Teacher Social Club is the very essential part of PRIMECH. One of the recurring themes that emerged during PRIMECH explorative interviews was the wish for more collaboration between Mechanics Teachers, within and across the faculties. The Social Club is where the Mechanics Teachers can meet, share experiences, learn from and inspire each other, and start collaborating at new exciting educational projects.

Second, the PRIMECH team considers installing a PRIMECH Support Team vital. We believe the PRIMECH Support Team should be there to provide consistent and frequent meetings and events, facilitate the development of new materials, tools and projects, and provide Mechanics teachers with discipline-specific educational support.

Last but not least, of course, are the tools that PRIMECH provides. [In the last newsletter](#), we discussed in details the online environment we started developing with the Statics teachers. The schematic view is shown below:



Developing a learning material repository.

We have been talking a lot about repositories and online environments. We want to share our journey for selecting the tools for PRIMECH, since we learned that a lot of people/groups in TUDelft are looking into creating a repository for learning material.

We started our journey with clear objectives (defined through several interviews with our stakeholders) . We need an online environment in order to:

- Improve students conceptual understanding.
- Improve students metacognitive skills and autonomy.
- Improve students and teachers peer to peer interaction.
- Enable teachers to share materials and best practices .

Then we analyzed our needs and wishes to come up with the list of requirements for the repository:

- Maintainable, should not depend on specific people.
- Accessible for everyone, but options for different levels of accessibility.
- Compatible with Youtube, GraspLe, Mobius and other similar systems. Materials should be linkable in/to Brightspace.
- Durable and expandable: shared taxonomy and rules on how to add material.
- Clear structure: easy to navigate and to find material.

We further refined the repository structure during our 4th workshop with the Statics teachers:



We have started collaborating with TUDelft Library to find readily available solutions. We have chosen to work with SURF Sharekit, combined with Edusource user interface. The main reasons for choosing this is simple: it is available at this moment, and the library offers support. The support from the library is important with respect to maintenance and durability.

Most of the other requirements are met by Sharekit, except for the integration with Brightspace. However, the full integration is on the agenda of SURF, so we see a fit with all requirements in the future. The Edusource user interface does not yet offer all functionality that PRIMECH needs, specifically it is not possible to create a interactive mind-maps yet, so this is another part where further development is needed.

We are looking forward to closely collaborate both with the Library and the teachers in the development of this tool!

Education & Students Affairs, it aims at innovating first year Mechanics courses, and **our first focus is on Statics**.

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Newsletter

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This month we take a look at:

- [SAVE THE DATE: PRIMECH Mechanics social lunch](#)
- [Recap of PRIMECH steps so far](#)
- [Insights from the PRIMECH solution](#)
- [Self-Determination Theory](#)
- [... and the inspiration of the month.](#)

In case you missed them, you can find the previous newsletter issues [here](#). If you know people that might be interested in this newsletter, they can subscribe [here](#).

[SAVE THE DATE: PRIMECH Mechanics social lunch](#)



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WHEN AND WHERE

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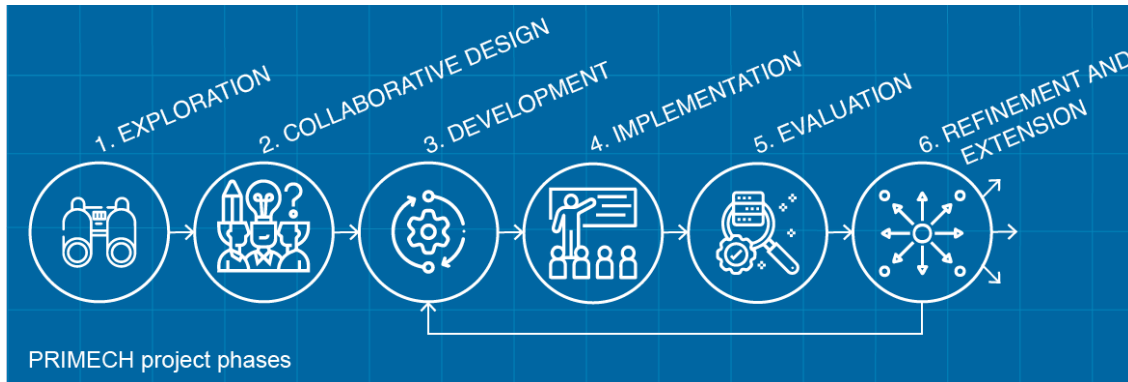
It is going to be fun! We will present PRIMECH results of this academic year and our plans for next year. But also, it will be a good opportunity for you to meet other mechanics educators from all around TU Delft, to share best ideas with your colleagues, to give your opinion and advice on the PRIMECH project and to get **free lunch** :)

ENROLL HERE!

PRIMECH Recap

In [previous newsletters](#) we have presented our project approach with six different phases. Before we start develop something, we want to have a clear understanding of the current situation, how it could be improved, and make sure that the intended users are onboard with the solution.

Therefore we are taking quite some time with the exploration and collaborative design phase. As we are moving almost to the development phase we thought it is a good time to give a summary of what we have learned so far.



From **1. EXPLORATION** phase, which consisted of interviews with many stakeholders, we learned that there are some recurrent themes in people's view on Mechanics Education:

- Helping more students adopt a deep approach to learning.
- Facilitating the alignment between Mechanics courses within a curriculum.
- Promoting the interfaculty exchange of material, good practices and peer-to-peer support.

As it wouldn't be practical to reform the entire Mechanics curriculum at once, we decided to start with the first year, first quarter course Statics. That means that the Statics teachers (Just Herder, 3mE; Hans Welleman, CEG; and Calvin Rans, AE) are our most important stakeholders and the intended first users of a PRIMECH tool.

With them, we started the **2. COLLABORATIVE DESIGN** phase, consisting of a couple of workshops where we discussed how PRIMECH could add value to the teaching system.

Looking back at those workshops now, we see that we have been talking about two different things: the teachers perspective and the student perspective.

We found some potential benefits for both:

1. **Teachers perspective:** where can PRIMECH add value to make teaching easier?
 - Sharing teaching materials and developing new materials together.
2. **Students perspective** (1st year bachelor students): where can PRIMECH add value to increase the learning results?
 - Improve & assess conceptual understanding.
 - Improve metacognitive skills and autonomy.
 - Accommodate different learning paces & latecomers.
 - Improving peer interaction.



PRIMECH Solution

Continuing in our phase **2. COLLABORATIVE DESIGN**, we arrived to a preliminary solution that we will finetune over the coming weeks/months.

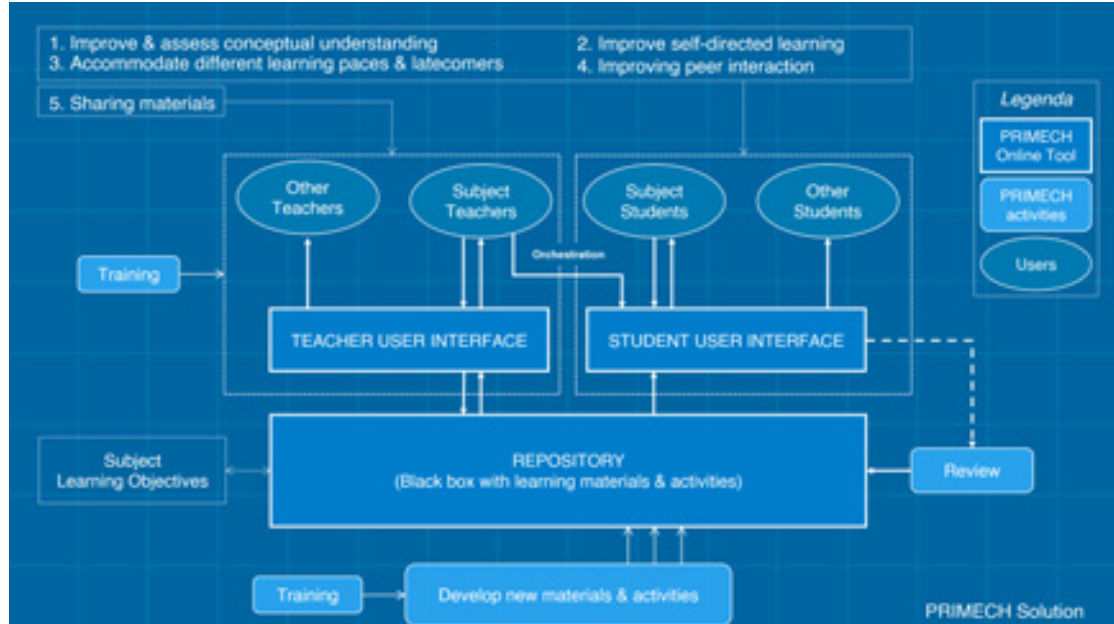
Our vision for PRIMECH solution is an **online tool** which consists of a repository and user-friendly navigation interfaces. Teachers can use the system to share materials and best practice. Students can find the learning materials they need during the course, following the route teachers proposed or autonomously selecting their learning path, depending on their personal learning needs.

PRIMECH choice of providing students with flexibility in their learning is supported also by the self-determination theory, if you are interested in this educational approach, check out [the following section](#).

Apart from the online tool, PRIMECH would also like to assist with some **activities** related to the tool:

- Provide training on how to use the tool.
- Provide support for the development of new learning materials and activities/assessment.
- Support the development of a social network for all Mechanics teachers.

A schematic view of the proposed PRIMECH system is shown below.



Self-Determination Theory and PRIMECH

A key aim identified by PRIMECH and by the lecturers we collaborate with, is to provide students with more flexibility in their learning, be that in their learning pathway, materials engaged with, or to catch-up and revise. In affording students more 'freedom' to navigate their learning, this comes with the increased importance on student's own self-determination and autonomy. To this end, PRIMECH has used self-determination theory (SDT) as a guiding framework.

SDT recognize that all people, and therefore all students, possess inner motivational resources. These resources can be vitalized or inhibited by the learning environment ([Niemiec & Ryan, 2009](#)). Specifically, when students feel a "sense of autonomy, competence, and relatedness" in their learning, their motivation increases.

To this end, it is important to note what can foster this autonomy. [Reeve \(2012:154\)](#) states that students' feeling of autonomy is affected by how important and valuable students believe the learning tasks is.

As such, PRIMECH is seeking to align the presentation and layout of Statics content to students in a way that makes the value and importance of what students are learning explicit. To do so, lecturers will share their work across courses. Then, we will be creating a digital mind map, inspired by the research of [Egelhoff and Burns \(2011\)](#), displaying connections between concepts, learning objectives and learning activities. We expect this to lead to further "subjective control" – students feel they have control over their actions and over the results of their actions ([Skinner, 1996](#)) and "subjective value" – the perceived value students have of their actions and the results of these actions. ([Pekrun, 2006:317](#)).

The PRIMECH team believes that through this mind mapping tool, shared resources, and thoughtful integration of these into classes, students can take further ownership of their studies, leading to improved education outcomes.

Monthly mix

This past month, the PRIMECH team dived deep into literature review of some useful educational theories and frameworks. Here a selection we would like to share with you!

- [Egelhoff, C.J. and Burns, K.L.](#), 2011, June. A heuristic to aid teaching, learning, and problem-solving for mechanics of materials. In 2011 ASEE Annual Conference & Exposition (pp. 22-48).
- [Niemiec, C.P. and Ryan, R.M.](#), 2009. Autonomy, competence, and relatedness in the classroom: Applying self-determination theory to educational practice. *Theory and research in Education*, 7(2),

pp.133-144.

- [Pekrun, R.](#), 2006. The control-value theory of achievement emotions: Assumptions, corollaries, and implications for educational research and practice. Educational psychology review, 18(4), pp.315-341.
- [Reeve, J.](#), 2012. A self-determination theory perspective on student engagement. In Handbook of research on student engagement (pp. 149-172). Springer, Boston, MA.
- [Skinner, E.A.](#), 1996. A guide to constructs of control. Journal of personality and social psychology, 71(3), p.549.

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Newsletter
Year:2022
Month:03

What is PRIMECH up to?

Hi there!

And welcome to the [PRIMECH](#) newsletter, where we take a closer look at the progress of the PRIMECH project.

This month we take a look at:

- [Insights from the second workshop with the Statics teachers](#)
- [Innovation in teaching and learning: PRIMECH for Statics](#)
- [... and the inspirational video of the month.](#)

In case you missed them, you can find our first issues [here](#). If you know people that might be interested in this newsletter, they can subscribe [here](#).

[Second PRIMECH workshop](#)



The PRIMECH project aims at the innovation of Mechanics education in TU Delft. We believe that teachers have an essential role in improving students' learning, being the ones not only teaching the subject content, but also structuring the course they deliver, deciding the learning objectives and choosing the learning activities. For this reason we think it is indispensable to co-develop educational innovation with teachers. Moreover, they will be the biggest user of any solution we develop, if we do it right!

We therefore arranged a series of workshops with the Statics teachers of three TU Delft faculties (Calvin Rans, AE; Just Herder, 3mE and Hans Welleman, CEG) to help us understand their experience in teaching Statics to massive classroom sizes, and where the opportunities are to innovate the course.

During the first workshop, which we discussed in our previous newsletter, we talked about the main Statics learning objectives. That workshop was also about getting to know each other and discover the similarities and discrepancies between the three courses. We found that there is actually quite a bit of overlap, and Calvin, Just and Hans all agreed on the main goal of the statics course:

Start thinking as an engineer: modelling

During the second workshop, we worked on where the challenges are in achieving this goal. We brainstormed and discussed which things could be improved by looking at different aspects of the course. We then ranked the suggestions, so we could find the top four most urgent and most interesting challenges in the current courses.

This means we now have a clear goal for the PRIMECH team. We aim to develop a product/system that will help to achieve the following things:

- Improve & assess conceptual understanding
- Improve metacognitive skills and autonomy
- Accommodate different learning paces & latecomers
- Improve peer learning and interaction

There is actually a fifth one: more collaboration between the faculties, but we believe we achieve that by working together in PRIMECH, and this is independent of the chosen solution.

Our goal for the next workshop is to propose a solution concept, and discuss that with Calvin, Just and Hans. We will keep you posted!



[Innovation in teaching and learning](#)

As we discussed in our previous newsletter, we use the [Course Innovation Framework](#) (CIF) developed by Tassone et al., to help us navigate the PRIMECH project. Last month we discussed the nature of the innovation we are aiming for, now we would like to talk some more about the third cluster of this framework: Innovation in Teaching and Learning.

The picture below, which shows the entire framework, this cluster consists of three sections:

- Typology
- Competence Domain
- Learning Domain

With respect to the Competence Domain, where innovations are identified as being related to academic competencies, operational competencies or life competencies, we want to remark that PRIMECH focusses on Academic competencies. It is good to realize though that at TU Delft the other competencies are being addressed at later stages of the curricula.

The Learning Domain is more interesting, as one of the main goals of the Statics Course has been identified as 'learning to think as an engineer'. This clearly indicates that learning has to take place on more levels than just the transfer of theoretical knowledge. With PRIMECH we therefore also look at Cognitive Learning (focusing on thinking processes), Affective Learning (attitude and motivation), Metacognitive Learning (e.g. learning skills such as planning and reflecting) and Social Skills (e.g. collaboration, communication).

Attained – Implemented – Intended Course Innovation <small>Informed by van den Akker, 2003</small>	<p>Rationale for the Innovation cluster</p> <p><i>Informed by Brans et al., 2016; Bangheh et al., 2009; Cai, 2017; Hannan et al., 1999; WUR, 2014; WUR 2017.</i></p> <p>Contextual Background</p> <ul style="list-style-type: none"> ✓ Course Level ✓ Type of Course ✓ Budget ✓ Composition Team ✓ Academic Departments <p>Reason</p> <ul style="list-style-type: none"> ✓ Challenges in Teaching, Learning & Assessment ✓ Changes in Society ✓ Changes in Student Population ✓ Challenges relating to Logistics & Resources <p>Underpinning</p> <ul style="list-style-type: none"> ✓ Theoretical Underpinning ✓ Empirical Underpinning ✓ Experiential Underpinning <p>Institutional Goal</p> <ul style="list-style-type: none"> ✓ High-quality Scientific Knowledge ✓ Rich Learning Environments ✓ Flexibility & Personal Learning Paths 	<p>Nature of the Innovation cluster</p> <p><i>Informed by Bessant, 2013; Cai, 2017; Fung, 2017; Gupta et al., 2006; Tassone et al., 2018; WUR 2014; WUR, 2017.</i></p> <p>Depth</p> <ul style="list-style-type: none"> ✓ Incremental Innovation ✓ Radical Innovation <p>Newness</p> <ul style="list-style-type: none"> ✓ Explorative Innovation ✓ Exploitative Innovation <p>Connection between Curricula & Society</p> <ul style="list-style-type: none"> ✓ Education for Society ✓ Education with Society 	<p>Innovation in Teaching & Learning cluster</p> <p><i>Informed by Anderson et al., 2001; Barnett, 2009, Barth et al., 2007; Sipos et al., 2008; Van den Akker, 2003; WUR 2014; WUR, 2017.</i></p> <p>Typology</p> <ul style="list-style-type: none"> ✓ Innovation of Rationale ✓ Innovation of Objective ✓ Innovation of Content ✓ Innovation of Activities ✓ Innovation of Digital (& Non-digital) Materials & Resources ✓ Innovation of Grouping ✓ Innovation of Location/Environment ✓ Innovation of Time ✓ Innovation of Assessment <p>Competence Domain</p> <ul style="list-style-type: none"> ✓ Academic Competence ✓ Operational Competence ✓ Life Competence <p>Learning Domain</p> <ul style="list-style-type: none"> ✓ Cognitive Learning ✓ Affective Learning ✓ Psychomotor Learning ✓ Metacognitive Learning ✓ Social Skills Learning 	<p>Evaluation & Dissemination Strategy cluster</p> <p><i>Informed by Gannaway, 2013; Jacobs, 2000; Nygaard & Bellugi, 2011; Southwell et al., 2010; WUR 2014; WUR, 2017.</i></p> <p>Evaluation Strategy</p> <ul style="list-style-type: none"> ✓ Inclusion or Lack of Evaluation Strategy <p>Dissemination Strategy</p> <ul style="list-style-type: none"> ✓ Dissemination for Awareness ✓ Dissemination for Understanding ✓ Dissemination for Action
	<p>Consistency & Reflection cluster</p> <p><i>Informed by Van den Akker, 2003; Kirkpatrick and Kirkpatrick, 2006</i></p> <p>Implementation Consistency</p> <ul style="list-style-type: none"> ✓ Consistency or Differences between Intended and Implemented Innovation <p>Outcome Consistency</p> <ul style="list-style-type: none"> ✓ Consistency or Differences between Intended and Attained Innovation <p>Durability</p> <ul style="list-style-type: none"> ✓ Continuation or Extinction of the Innovation after Implementation <p>Reflection</p> <ul style="list-style-type: none"> ✓ Experiences ✓ Lessons Learned ✓ Suggestions for Others 			

The first category, Typology, explores the different components of a course. During the second workshop with the Statics teachers, we used this list as a guide for our brainstorm session. It functioned as a checklist to explore the solution space we have available for innovating education.

An innovation can be related to one or more of the following course components:

- Rationale: Why students learn
- Objectives: Objectives to which students learn
- Content: What students learn
- Activities: How students learn
- Materials and Resources: With what students learn
- Grouping: With whom students learn
- Location: Where students learn
- Time: When students learn

- Assessment: How students are assessed

The Statics teachers realized that most of the challenges they are facing when teaching first year Bachelor students, belong primarily to the Activities and Materials components, as well as to the alignment of these with the summative assessment.

For a more detailed description of the cluster, or for more background on the framework, we refer to [V. Tassone et al.\(2021\) Mapping course innovation in higher education: a multi-faceted analytical framework, Higher Education Research & Development.](#)



[Monthly mix](#)

With our inspirational [video](#) of the month, we want to target one of **the biggest urban legends about education**: learning styles.



Derek Muller has a PhD in Physics Education and he is best known for his science and technology YouTube channel: Veritasium. In this video, he compares the efficacy

of studying in your preferred mode vs. multimodal approaches and provides great advice to improve teaching activities.

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Newsletter

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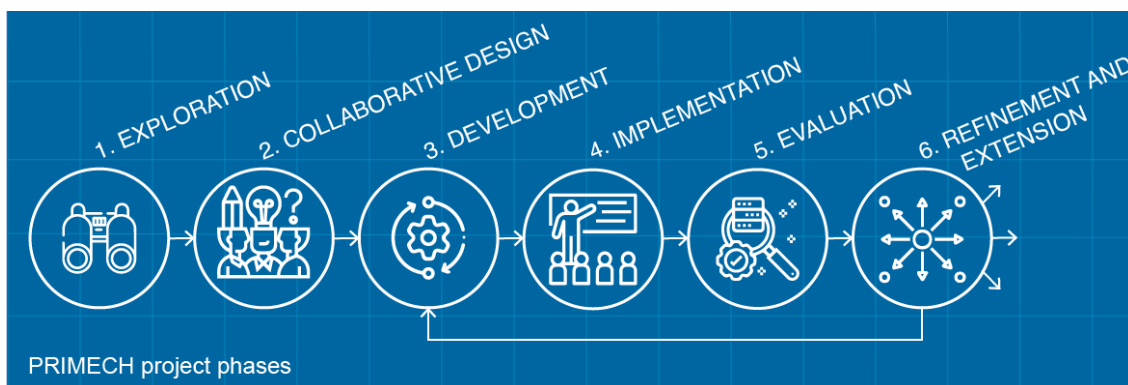
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This month we take a look at:

- [Insights from the first workshop with the Statics teachers](#)
- [Question of the month, we want to hear your opinion!](#)
- [The nature of educational innovation: PRIMECH](#)
- [More members of the PRIMECH team: Grant Penny](#)
- [... and a mix of news.](#)

In case you missed them, you can find our first issues [here](#). If you know people that might be interested in this newsletter, they can subscribe [here](#).

[First PRIMECH workshop!](#)



We are happy to report our progress with the PRIMECH project: we have officially moved from the exploration phase into the collaborative design phase! At the beginning of February, we ran our first workshop with three Statics teachers: Just Herder (3ME), Hans Welleman (CEG) and Calvin Rans (AE). It was a very nice afternoon for us, the PRIMECH team, as we feel we are now entering the heart of the project.

The choice of starting with Statics is based on the outcomes of interviews with a lot of stakeholders (exploration phase). In the faculties of 3ME, CEG and AE, Statics is similarly taught during the first quarter of the first year Bachelor. It is the first encounter of students fresh from high school with engineering. Working on the innovation of this course fits two of the PRIMECH goals: 1. helping more students adopt a deep approach to learning and 2. promoting interfaculty collaboration and exchange of material, good practices and peer-to-peer support.

First of all, we would like to thank Hans, Just and Calvin for their participation and for sharing their

thoughts and ideas. We believe just getting them together and have a chat about the subject they are passionate about was already a success. But we also had deep conversations about the essence of Statics, and together we defined the main learning goal of this subject as:

Start thinking as an engineer: modelling



Modelling in Statics consists of:

1. Conceptualize the physical system in the form of a free body diagram
2. Determine whether the system is in static equilibrium
3. Determine force and moments acting and reacting on the physical system



We also talked about the things that are currently going well, the things that could be improved upon and additional opportunities for innovation. This gave us a nice list to start discussing what we would like to develop together, which will be the topic of our second workshop, taking place very soon. We will keep you posted!

Question of the Month

"From your experience, what is the most effective teaching approach to foster conceptual understanding in first year students?"

Zoom out: from specific applications and cases to general theory/helicopter view

Zoom in: from general theory and phenomena to specific formulations/applications and why?"

share your answer

Nature of the innovation

An education innovation project such as PRIMECH, where we don't know at the start what product will be developed, can be kind of tricky to manage and keep track of. Therefore we are using the [Course Innovation Framework \(CIF\)](#) to depict our progress. CIF has been developed at the Wageningen University and Research (WUR) by Tassone, Biemans, den Brok and Runhaar, and it describes 5 clusters of characteristics of innovation processes:

1. Rationale of the innovation
2. **Nature of the innovation**
3. Innovation in teaching and learning
4. Evaluation and dissemination strategy
5. Consistency and reflection

In our last newsletter we dived a bit into the rationale of PRIMECH, this month we want to discuss the nature.

There are two dimensions of the nature of the innovation that are relevant for PRIMECH: newness and depth. **Newness** deals with 'how new' the educational tools and approaches used in the intervention are. As PRIMECH is not a research project, we do not directly aim at developing new educational tools and approaches from scratch. Instead, we will be looking at evidence-based educational practices, effective educational strategies supported by evidence and research.

With respect to **depth**, Tassone et al. name two directions: incremental innovation and radical innovation. With PRIMECH we keep both options open. If, together with teachers and the other stakeholders involved, we find an opportunity to implement radical changes that will enhance Mechanics education at TU Delft, we will take it. In that case we will most likely start with small incremental changes, and slowly work towards the more radical stuff. But radical innovation is not a goal in itself, the most important thing is to add value, and to improve the education system for all involved.

In our next newsletter we will talk more about the third cluster of the framework: Innovation in teaching and learning.

In the spot light: PRIMECH team members

In the last issues, we introduced team members Marta Gavioli (Project Leader), Aukje Kastellijn (System Architect) and Hans Hellendoorn (Project Supervisor). This month we proudly introduce:



GRANT PENNY: Learning Developer

After discovering a hidden passion for education, I undertook an MA in Online and Distance Education at the Open University (UK). Thereafter, I worked as an Educational Technologist in my home country of South Africa. My key focus-area over these years was incorporating blended teaching into traditional face-to-face courses. If the recent pandemic years have taught me anything, it is to be flexible in looking for solutions. I hope to encourage creativity and openness in the PRIMECH project – ultimately resulting in something unique and valuable for our students. In my free time I enjoy running and finding the best place for an espresso.

[Monthly mix](#)

In our inspirational [video](#) of the month, Manu Kapur shows how to spark conceptual understanding by making students fail (in a safe environment!). This strategy is called "productive failure". You may have heard about this before, indeed Kapur was a keynote speaker at the Educational Day 2021 organized by the Teaching Academy.

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Newsletter

Year:2022

Month:01

What is PRIMECH up to?

Hi there!

And welcome to the [PRIMECH](#) newsletter, where we take a closer look at the progress of the PRIMECH project.

This month we take a look at:

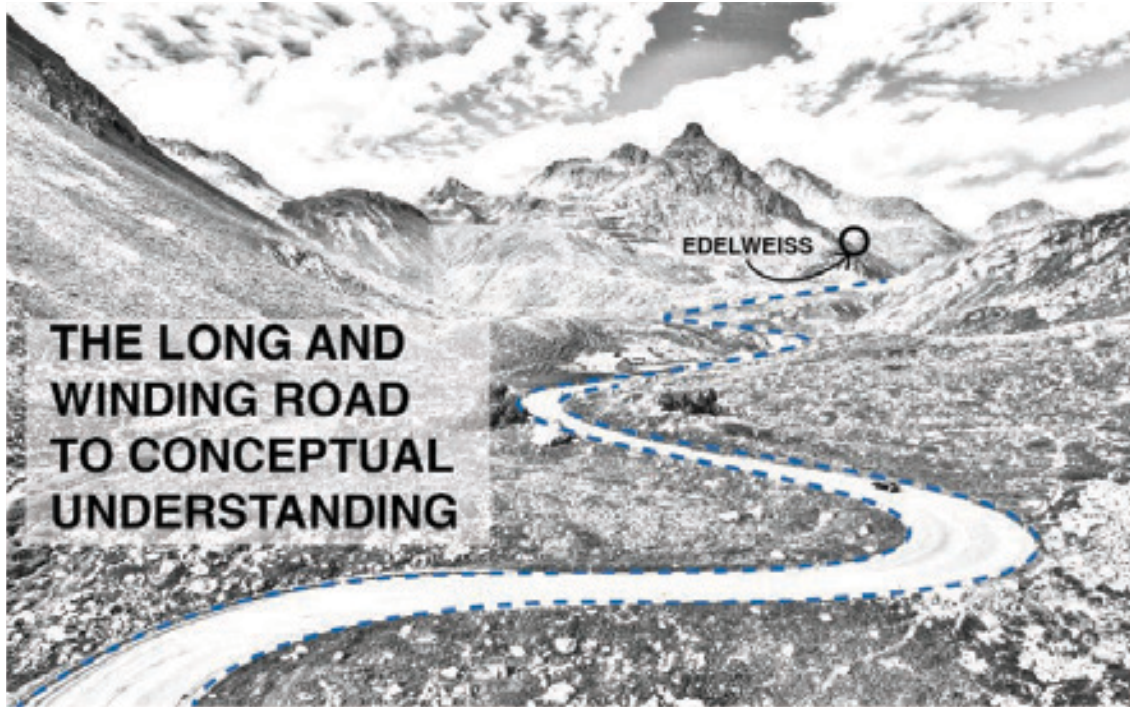
- [Insights from the interviews](#)
- [Question of the month](#), we want to hear your opinion!
- [The rationale behind the PRIMECH project](#)
- [More members of the PRIMECH team](#)
- [... and a mix of news.](#)

In case you missed it, you can find our first issue [here](#). If you know people that might be interested in this newsletter, they can subscribe [here](#).

In our previous newsletter we have shared the recurrent themes we have found during our exploration phase:

- Helping more students adopting a **deep approach to learning**
- Facilitating the **alignment between Mechanics courses** within a curriculum
- **Promoting the interfaculty exchange of material, good practices and peer-to-peer support.**

This time we want to share a more personalized view, by **showing the themes from a few different perspectives**: the mechanics teacher, the student, and the teacher of the follow-up course. We hope you recognize some of the characteristics, as we tried to give a [summary of all the feedback from the interviews](#). Let us know if we missed something important.



THE LONG AND WINDING ROAD TO CONCEPTUAL UNDERSTANDING

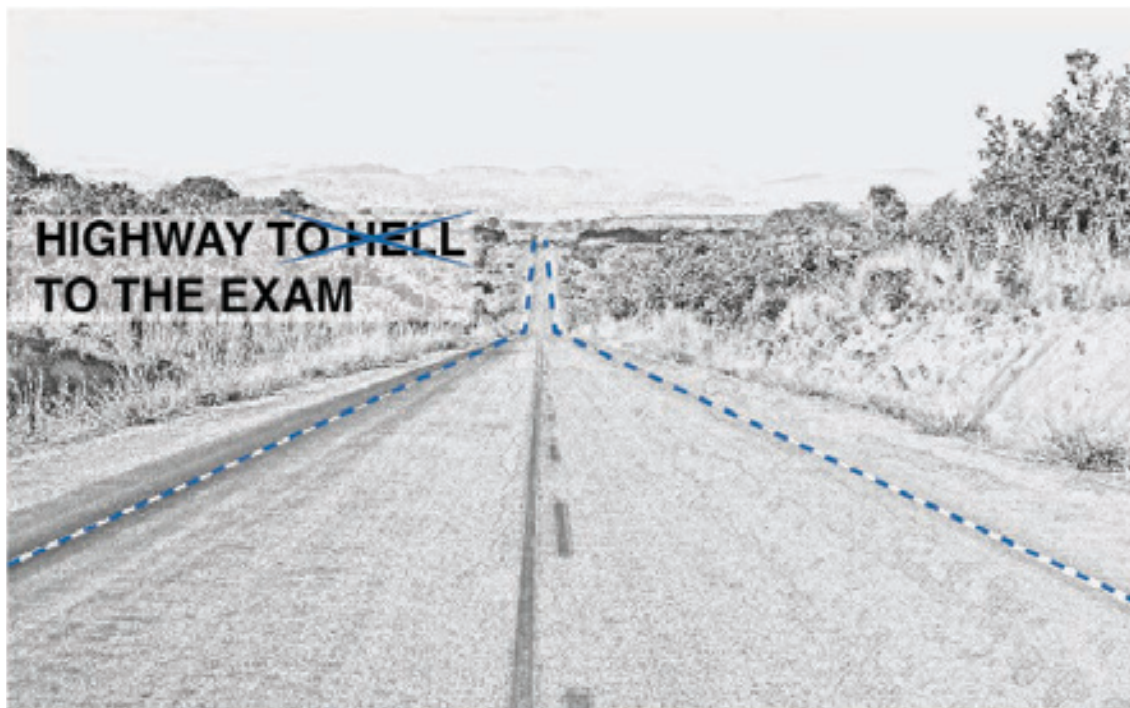


Teacher of Mechanics1

I hope students will engage with the course, so I can show them all the beautiful details, and they will deeply understand the subject.

The Teachers:

- Highly value the job of teaching to the next generation of engineers.
- Put much effort in engaging students but the time to develop and maintain the winding road is limited (balancing teaching with research, big cohorts of students).
- Want their course to be aligned with other teachers/courses,
- ... but want to keep their teaching freedom.



HIGHWAY TO HELL TO THE EXAM

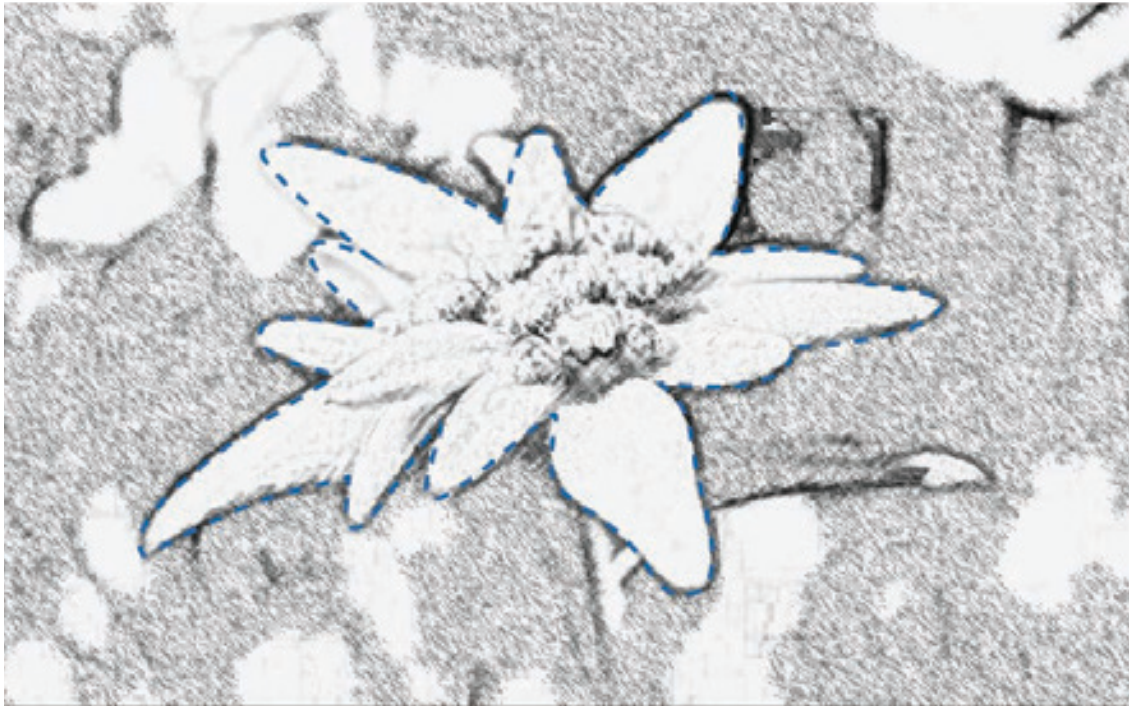


Student

If I pass the exam, it means I learnt the subject and I can move on in my studies. Just show me the quickest way to do it!

The first-year Students:

- Have just finished high school and decided to study engineering.
- Don't always understand the importance of the subject.
- See their curriculum of studies more as an obstacles course than a learning experience.
- Have a hectic schedule, between courses and extra-curricular activities.
- Haven't mastered how to study yet.



Teacher of Mechanics2

What do you mean,
you have never seen an edelweiss?

Teachers of follow-up courses:

- Want students to retain more what they learnt in the first year.
- Have limited "lecture time" and cannot re-explain everything.
- Wish they could focus more on the more advanced and fun content.

[Question of the Month](#)

Here's another of our questions for you:

"How do you inspire students to take the long road to conceptual understanding?"

We have set up a padlet for you to share your answers. You can also see what the others said, upvote your favorite answers and comment.

All of this by clicking on this button:

share your answer

Rationale for Innovating Mechanics Education in TUDelft

The aim of PRIMECH is to innovate Mechanics Education in order to foster conceptual understanding and improve students retention. There are many reasons behind this aim.

Firstly and more importantly, there are some challenges to face in the way these courses are currently taught, learnt and assessed. We discovered these challenges during our interviews with the teachers and the students study associations, and we tried to summarize them in the previous section. Solving these challenges will improve not only students learning, but it will also make teachers' job easier, more effective and rewarding. What the actual solution will be is something that will be discussed with the involved teachers.

At the same time, the society we live in is going through some fast changes. The need of engineering graduates is increasing every year. The current Bachelor educational system at TU Delft is scalable till a certain number of students, after that the system will have to be radically changed. As PRIMECH, we want to spark the discussion around the Bachelor education of the future and help the university be prepared. This also ties in with the institutional goals (among others) to support the growth of the number of students and to develop a vision on the campus of the future.

In the spot light: PRIMECH team members

Last month we introduced team members Marta Gavioli (Project Leader) and Aukje Kastellijn (System Architect). This month we proudly introduce our Project Supervisor Hans Hellendoorn.



HANS HELLENDOORN: Pro Vice Rector Joint Education

I studied computer science in Delft and wrote a PhD on reasoning with uncertain knowledge. Next, I went to Siemens R&D in Munich where I headed a department on fuzzy control. Back in The Netherlands, I worked for Siemens on training simulation and innovation. In parallel, I became part-time professor for soft computing at EEMCS. In 2011, I became full-time professor and department head at 3mE.

As Director of Education from 3mE I detected my passion for education management. In particular, as main supervisor in the project, I like the problem we face in PRIMECH: how do we teach more than 2,000 students in engineering courses, combining online, large halls, group assignments, and individual attention in such a way that it is feasible for the organization and increases the learning yield?

I like being outside: biking, walking, hiking, skiing. I hope, traveling is soon possible again!

Monthly mix

- **The Educator** (TU Delft Education News) published an article about PRIMECH in their January issue, you can read it [here](#).
 - Our inspirational [video](#) of the month, where Dan Meyer wonders how to help students see that **math formulations are a special power, and not a punishment**. Even if he addresses high school math, we think it applies well to our first year students.
 - We hope you noticed our musical references! This is a **small playlist** for this newsletter: [The Long and Winding Road](#) by The Beatles and [Highway to Hell](#) by AC/DC.
-

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Newsletter

Year:2021

Month:12

What is PRIMECH up to?

Hi there!

And welcome to the PRIMECH newsletter, where we take a closer look at the progress of the PRIMECH project.

You are receiving this newsletter because you have crossed paths with us in the last months. **We heard that lately you have not been able to sleep at night, wondering "what is PRIMECH up to?!"**. So here we are with a short report of

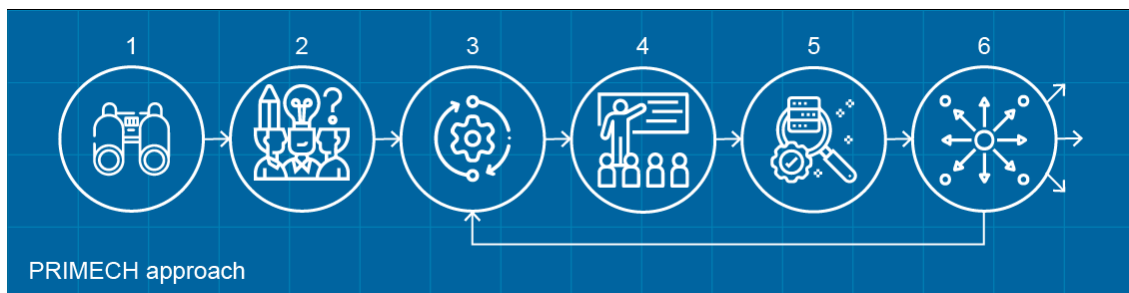
- [What PRIMECH is](#),
- [What we have been doing so far](#) (SPOILER ALERT),
- [What is going to happen next](#) (DOUBLE SPOILER ALERT),
- [Who are the people working at PRIMECH](#)

together with [our warmest wishes](#) for the upcoming holidays and some [fun activities](#) to connect with each other!

PRIMECH stands for **PR**ogramme of Innovation in **MECH**anics education. It is an interfaculty project started at TUDelft the 1st of October 2021. It has been initiated by the Student Council, it aims at innovating first year Mechanics courses, and **our first focus is on Statics**.

PRIMECH is inspired by PRIME (which focuses on Math education instead, click [here](#) if you don't know PRIME!). However, we realized very soon that PRIME started from a different context than PRIMECH. Therefore, we took the chance to take a step back and **better understand the current situation of Mechanics Education in TU Delft**.

We have decided on a general approach we would like to follow for this project, which comprises of six phases:



1. **Exploration**
2. **Collaborative design (with teachers, students, ...)**
3. **Development**
4. **Implementation**
5. **Evaluation**

[So far](#), we have dived into the **exploration phase**, trying to picture the current habitat of Mechanics education in TU Delft, especially in the first year Bachelor of 3ME, AE and CEG faculties. We are focusing on pain points and opportunities for improvement.

We are also looking for **opportunities for interfaculty collaboration**. We have not finished interviewing everyone in our list yet, however we have a **SPOILER on some of the recurrent themes**:

- Helping more students adopting a **deep approach to learning**. For example learning how to learn, becoming a university student, seeking for conceptual understanding, improving retention and transfer of Mechanics knowledge.
- Facilitating the **alignment between Mechanics courses** within a curriculum, helping students seeing how the different courses fit together and form a path to become an engineer.
- Promoting the **interfaculty exchange of material, good practices and peer-to-peer support between teachers**, "no need to reinvent the wheel every time, also because we have already pretty good wheels in TU Delft".

[Next](#), we are looking forward to collaborate with you in the development of a 'PRIMECH solution'. We will do that by organizing multiple **workshops** and the first will be early next year. This will also mark the start of phase 2: **collaborative design**.

Our first focus will be on the Statics courses. We are really looking forward to the discussion with the teachers, hearing their views on education in general and on Statics in particular. If you would like to **contribute to the discussion**, check our ["next question but with a twist"](#) at the end of the newsletter!

["What is good education?"](#)

We have been asking this question to everyone during the explorative interviews. We know you are curious to know what the others said, so here is a sneak peak of the replies:

Good education..

- *Sparkles students curiosity and makes them eager to learn more.*
- *Is inclusive.*
- *Exposes students to a variety of learning environments (lecture, team work, self-study), teaching approaches, etc..*
- *Is based on the social interaction between students and teachers.*
- *Suits the subject, the students and the teacher's personality.*
- *Intrinsically motivate students to do what they have to do.*
- *Helps students to integrate their prior knowledge with new knowledge.*
- *Balances and integrates fun and learning.*
- *Provides a safe environment for students to fail and learn from their mistakes.*
- *Gives students the necessary and specific knowledge, skills, tools and attitude for their future careers and to solve future societal challenges.*
- *Is an art, a craft and a science together.*

[Next question, but with a twist!](#)

Having fun with these questions? Here's another one for you:

"What is the most important skill people should learn from Statics? And why?"

We have set up a padlet for you to share your answers. You can also see what the others said, upvote your favorite answers and comment. It is also a good chance to share holidays wishes and cool stuff about education. **There may or may not be already cool stuff in there.**

All of this by clicking on this button:

share your answer

[In the spot light: PRIMECH team members](#)



MARTA GAVIOLI: Project leader

I studied Electrical (power) Engineering in Padua University, in Italy. During this time, I also organized several educational projects in science and technology for local schools. This is when I got curious about effective and fun ways of teaching difficult concepts. After working two years as a lighting engineer between Italy, Dubai and Doha, in 2017 I moved to Delft to pursue a PhD in Engineering Education. My PhD project is about developing Conceptual Understanding of Mechanics with lab activities. I think the knowledge acquired from this experience will help a lot in leading the PRIMECH project.

I am a very creative person and a strong team player. In my free time, I like to go bouldering, to draw and to knit.

AUKJE KASTELIJN: System architect

I am a freelance opto-mechatronic system architect with over 20 years of experience in the development of precision equipment. Since both my parents were teachers, I always thought I would become one as well, but I got side-tracked by some nice projects in the industry. However, being part of the [JIP team](#) in 2021 reignited my interest in education, so I am happy that I can be a part of PRIMECH.

Over the years I have developed not only my understanding of mechatronic systems, but also some personal skills. I have a pragmatic and pro-active attitude and I am an analytical system thinker. With these skills I want to bring value to the PRIMECH project.

My spare time is for the woods, where I strive to become a better photographer.



[Few words from the Student Council:](#)



Hi, I'm **Julian van Dijk**, faction member of Lijst Bèta and member of the **central student council of TU Delft**. My portfolios include Campus facilities & sustainability, Quality assurance, Regulations, Finance, International students, Internationalization, IT, and, last but not least, **educational innovation**.

Educational innovation is the portfolio where the idea of PRIMECH was sprouted. The program was thought up after seeing what PRIME did for mathematics education. We expect PRIMECH to improve mechanical courses just as well as PRIME did, but possible in an entirely different way. **As student council, we are very excited to see what PRIMECH will bring for mechanical courses in the future.**



The PRIMECH team would like to wish all of you and your families [Happy Holidays and Happy New Year!](#) Thank you to everyone for your valuable inputs, suggestions and trust in the PRIMECH project so far, we're excited to see what next year will bring us.

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