

Preparing for the world of work and reducing grading time with Mastering Physics

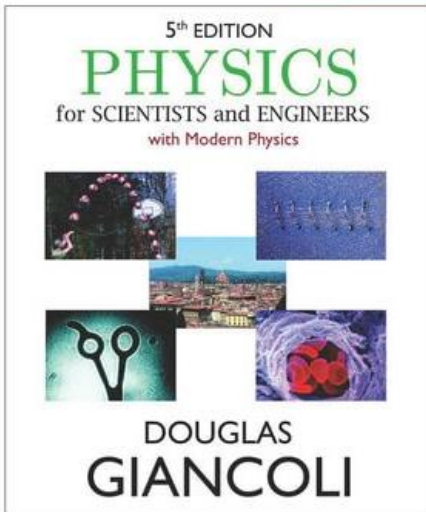
Instructor: John Sheil

Institution: Advanced Research Center for Nanolithography in Amsterdam

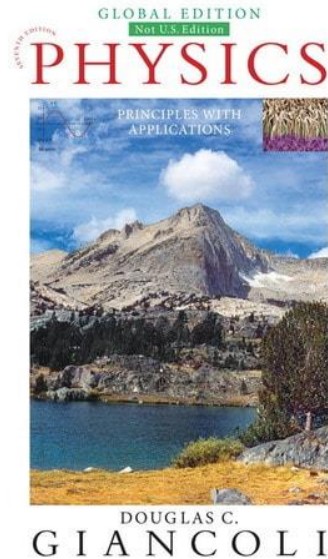
Title used: Giancoli: Physics for Scientists and Engineers

2024

GLOBAL
EDITION



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Course

John Sheil, based at the Advanced Research Center for Nanolithography in Amsterdam, teaches Physics 101 for medical and natural science students at the **University of Amsterdam**. With cohorts of up to **100 students**, his course introduces classical mechanics, focusing on energy, mass, momentum, and particle motion. He uses [Giancoli: Physics for Scientists and Engineers](#) and adjusts editions to align with the compatible **Mastering Physics** system.

The book

I selected the textbook *Giancoli: Physics for Scientists and Engineers* due to its suitability for students not primarily studying physics, finding its comprehensive explanation and abundance of examples beneficial. Despite inheriting the book rather than actively choosing it, I appreciate its **clarity and usefulness**, especially in conjunction with the Mastering Physics system's compatibility and graded difficulty levels for homework.

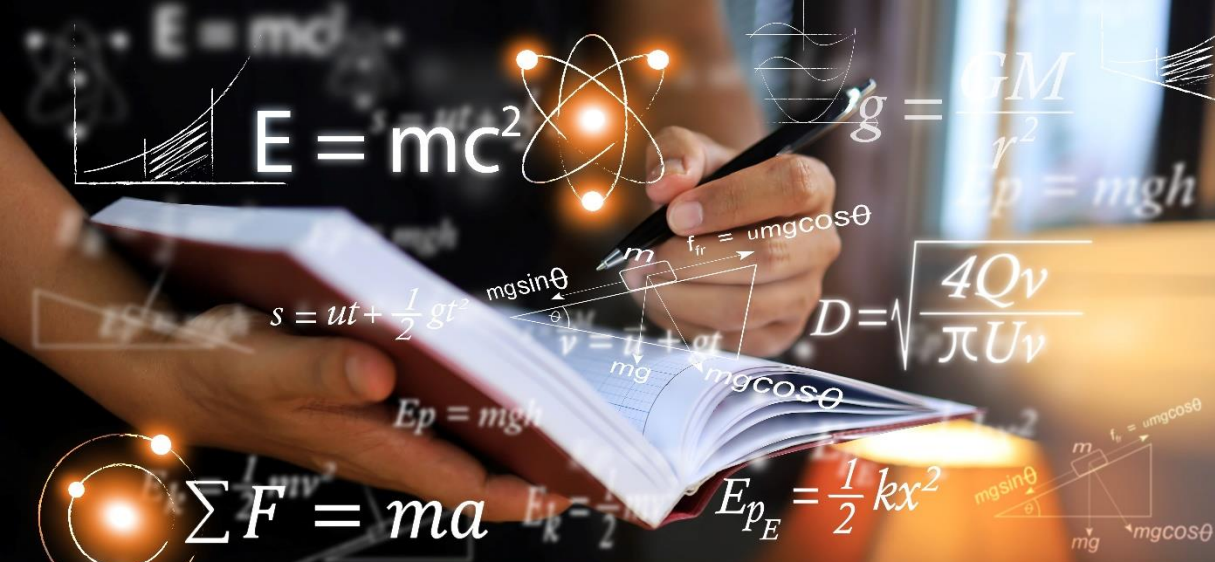


"Overall, Mastering Physics provides an effective platform for training students to think critically and analytically, which is essential for success in the world of work."

John Sheil



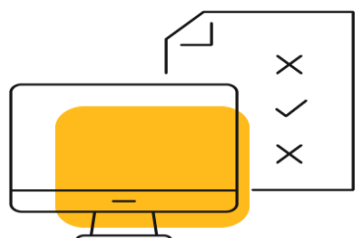
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Assessment

As the primary assessment method, aside from the final exam, students engage in **continuous assessment** through Mastering Physics. Each week, a new topic was introduced in class, followed by students having a week to respond to a set of predetermined questions on that topic in Mastering Physics.

Tutorials aligned with the weekly topics, spanning seven instances. Achieving above 60% in these assessments contributed to the final grade, with a fraction, possibly 10%, awarded accordingly. This system **heavily relied on Mastering Physics** and the final exam, serving as the cornerstone of the course and significantly impacting its overall structure and evaluation process.



Students had **7 assignments**. If they score above 60%, they get a bonus point. By doing the **homework** every week was rewarded in their final grade.

The significance of Mastering Physics is further underscored by its role in promoting **academic integrity**, particularly in the context of students' initial experiences at university, which can be daunting. Unlike handwritten exams that may be susceptible to cheating, Mastering Physics employs **dynamic features** such as altering numbers and question order, compelling students to independently tackle each task. This not only enhances their learning experience but also minimises the temptation to seek external assistance during assessments.

By fostering **self-reliance and authentic engagement**, Mastering Physics emerges as a valuable tool in nurturing students' academic growth and ensuring a fair and conducive learning environment.



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Overcoming challenges

One major advantage of Mastering Physics is its **flexibility**, enabling students to access and complete assignments from **anywhere** and at **any time**. Despite personal preferences for traditional methods, the practicality of this online platform is acknowledged, particularly in light of the impracticality of manually grading numerous weekly assignments.

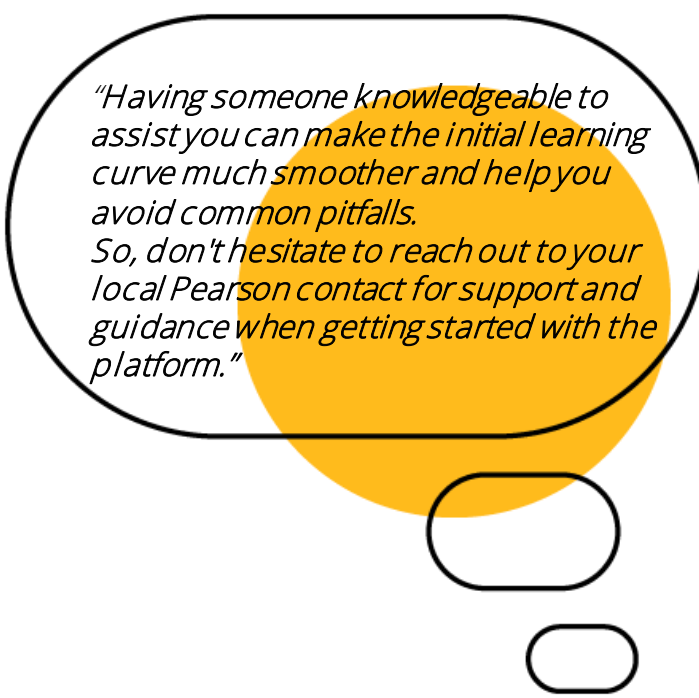
Moreover, Mastering Physics is praised for **fostering critical thinking** among students through challenging questions, supplemented by helpful hints and unlimited attempts, ultimately **aiding in their comprehension** of complex topics. It's regarded as an ideal platform for beginners due to its supportive features, including interactive videos that elucidate problem-solving processes.

The integration of Mastering Physics into the curriculum primarily revolves around **weekly assignments**, providing students with the opportunity to engage with the material consistently and earn points accordingly.

Pearson support

In terms of support, I rely heavily on the capabilities of Mastering Physics, working closely with the **local Pearson representative** who provided invaluable assistance, especially considering it was my first time teaching the course last year.

While I was unfamiliar with Mastering Physics as a former physics student, the local Pearson colleague guided me through the process, even dedicating time to explain its functionality alongside a colleague, ensuring we fully understood its features and operation.



"Having someone knowledgeable to assist you can make the initial learning curve much smoother and help you avoid common pitfalls. So, don't hesitate to reach out to your local Pearson contact for support and guidance when getting started with the platform."

Credit – Integration – Communication

To streamline the process of integrating Mastering Physics into the curriculum, I devised a concise and clear document using LaTeX, which served as a **comprehensive guide for students**. This document outlined **step-by-step instructions** for registering on the Mastering Physics portal, complete with unique access codes to ensure individual accountability. Additionally, technical issues and grading policies were detailed to pre-emptively address potential concerns. By embedding direct links and providing an overview of the portal's functionalities, I aimed to equip students with the necessary resources to navigate Mastering Physics independently. This proactive approach yielded **positive results**, with minimal inquiries from students and a high registration rate.

Moreover, by fostering a culture of **self-reliance and accountability**, Mastering Physics became seamlessly integrated into the course structure, facilitating students' academic autonomy and growth.

Benefits for educators

“Mastering Physics has undeniably made my life as an educator easier and more efficient.”

“I can actually focus on the teaching rather than issues to do with grading. In that sense, it makes my life easy because I can then focus on making sure the course material is really good, and then it also kind of gives me ways of looking at not only explaining things in class or I can come up with similar examples, but also questions that I can put into tutorial sections which are also from the book.”

By providing a comprehensive platform for assessments and grading, it **frees up valuable time** that would otherwise be spent on administrative tasks. This **allows me to focus more on delivering high-quality instruction** and refining course materials to enhance students' learning experiences. Moreover, Mastering Physics serves as a **source of inspiration** for creating new and innovative questions for exams and tutorials. While I wouldn't directly replicate questions from the platform, it offers valuable insights and **prompts creative thinking** when designing assessments. In fact, some of my exam questions have been inspired by the types of challenges presented in Mastering Physics, albeit with unique twists tailored to my course objectives.

Overall, the platform has not only streamlined the grading process but also stimulated my creativity as an educator, ultimately benefiting both myself and my students.

What students say



The **absence of complaints** or negative feedback regarding Mastering Physics throughout the course is indicative of its positive reception by students. Despite encountering occasional challenges, such as an overload of questions in a given week, **students generally adapted well to the platform**. Notably, there were no grievances about question clarity or portal usability, suggesting a high level of satisfaction with Mastering Physics as an assessment tool. The lack of critical feedback can be interpreted as tacit approval and appreciation for the platform's effectiveness and utility. Had there been significant issues, they likely would have surfaced in course evaluations. Therefore, the overall response underscores the success and acceptance of Mastering Physics as a **valuable component of the learning experience**.

Impact on student engagement and active learning

The implementation of Mastering Physics did not significantly alter students' engagement or active learning behaviour, as those who scored well were generally already highly engaged in class. When directly questioned about their opinion of Mastering Physics, students expressed satisfaction with its utility and effectiveness. However, it's challenging to quantify the exact impact on student engagement. Nonetheless, it's estimated that at least **70% of students benefited** from Mastering Physics, particularly those who achieved a score above 60%, which contributed to their final grade. Despite some fluctuations in engagement levels over the course of the term, such as instances of students feeling overwhelmed or seeking last-minute opportunities to improve their grades, the **overall impact of Mastering Physics was positive**, as it provided a structured and effective means of assessment.

Benefits for students

Mastering Physics offers a valuable complement to traditional classroom instruction by providing assessments that test students on the material covered in class, albeit with a twist. The questions presented on the platform are related to the topics discussed in class but often require students to **think critically and apply their knowledge** in slightly different contexts. This approach challenges students to truly understand the underlying concepts rather than simply memorising specific solutions. Additionally, the inclusion of hints and multiple-choice questions offers a **supportive environment** for learning, allowing students to gauge their understanding and receive feedback in real time. While the questions may deviate slightly from those encountered in class, this variation serves to **deepen students' comprehension** and prepare them for the nuanced challenges they may face in the field of physics.

Overall, Mastering Physics excels in presenting innovative ways to assess students' understanding and promote active engagement with the course material.



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Favourite feature

My personal favourite feature of the platform is the **hints and explanations** provided. They are incredibly helpful for students who may be struggling with certain concepts or problems.

Additionally, I appreciate the overall **user interface and design** of the platform. A professional-looking interface not only enhances the credibility of the platform but also encourages students to engage with it more seriously. It's important for educational tools to be **visually appealing and user-friendly**, and Mastering Physics excels in this aspect.

Advice for first-time users

My advice for first-time users, especially teachers, would be to **seek guidance and support** from someone experienced with the platform. I found it extremely helpful to talk to the local representative, who provided clear instructions and guidance when I first started using the portal. The Pearson rep was able to simplify the process and point out important features to pay attention to, such as setting the correct time zone.

Having someone knowledgeable to assist you can make the initial learning curve much smoother and help you avoid common pitfalls. So, don't hesitate to reach out to your local Pearson contact for support and guidance when getting started with the platform.

Another standout feature for me is the breakdown of grades per question and per concept. This allows me to identify specific areas where students may be struggling and adjust my teaching accordingly.

For example, if I notice that a significant number of students are having difficulty with a particular topic like angular momentum, I can spend extra time in the next class addressing those challenges and providing additional explanations. This real-time analysis of student performance is invaluable for refining my teaching methods and ensuring that all students have the opportunity to succeed.



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Preparing students for the world of work

*I believe that Mastering Physics supports students in **preparing for the world of work** by fostering critical thinking skills. While the course content may focus on specific topics like Pascal mechanics for medical students, the underlying goal is to train students to **think like physicists**.*

The problems presented in Mastering Physics often require students to think outside the box, analyse complex scenarios, and **systematically approach problem-solving**. This type of training is invaluable for the workplace, where employees are often faced with novel challenges that require creative solutions.

Additionally, Mastering Physics emphasises **deep learning** over rote memorisation, encouraging students to understand concepts deeply rather than simply memorising facts. This approach aligns well with the demands of many professional fields, where problem-solving skills and critical thinking are highly valued.

Overall, Mastering Physics provides an effective platform for training students to think critically and analytically, which is essential for success in the world of work.

For more information about Mastering Physics, please visit

<https://www.pearson.com/en-gb/higher-education/products-services/mastering/mastering-physics.html>

