COURSE REPORT

Course	BN1111 - BIOMEDICAL ENGINEERING PRINCIPLES AND PRACTICE I
Academic Year/Sem	2024/2025 - Sem 1
Department	BIOMEDICAL ENGINEERING
Faculty	COLLEGE OF DESIGN & ENGINEERING

Note: Class Size = Invited; Response Size = Responded; Response Rate = Response Ratio

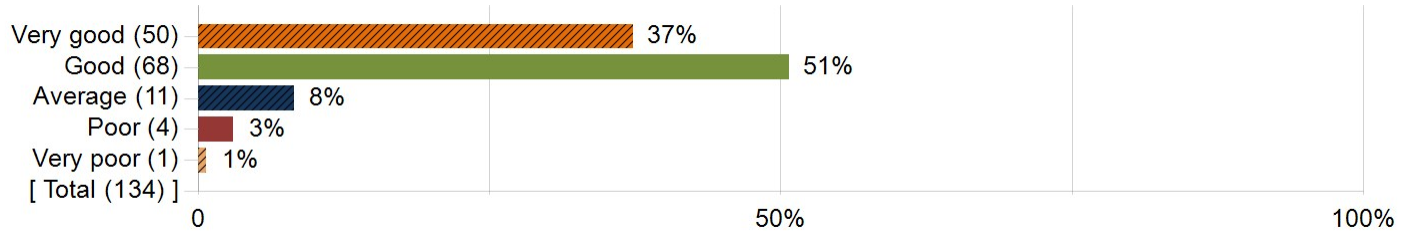
Raters	Student
Responded	134
Invited	185
Response Ratio	72%

Instructors of large courses (500+ students) can now benefit from an AI-powered tool developed by ODI in collaboration with PVO. This tool analyzes qualitative student feedback to provide quantitative summaries, offering valuable insights alongside the traditional reports. Access the summary here. For inquiries or suggestions on improvement, please contact Ms ONG Mui Hong (Director TEL) at muihong@nus.edu.sg

1. Overall opinion of the course

Distribution of Responses

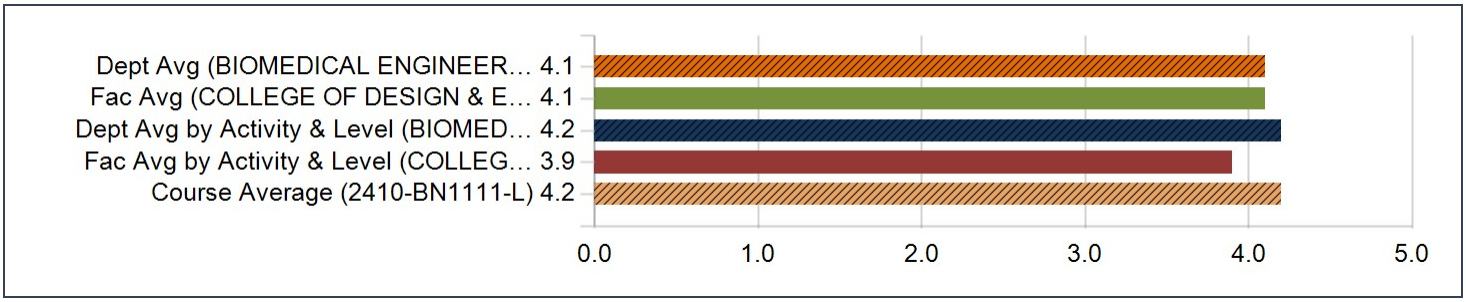
What is your overall opinion of the course?



Statistics	Value
Response Count	134
Mean	4.2
Median	4.0
Mode	4
Standard Deviation	0.8
Positive Feedback	88%

Rating Scores

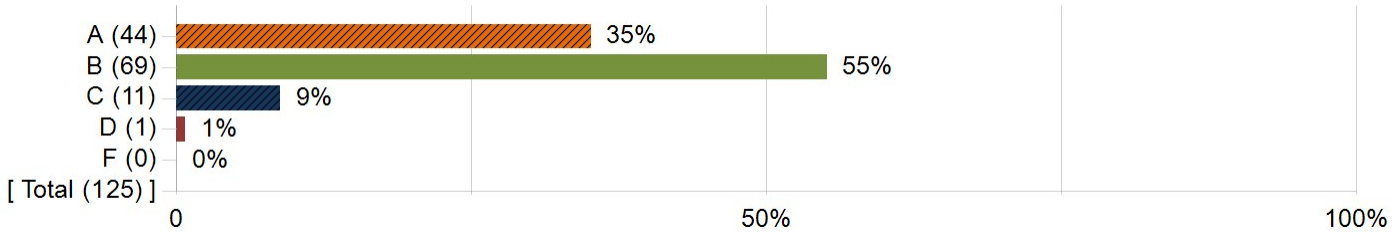
Question	Dept Avg (BIOMEDICAL ENGINEERING)		Fac Avg (COLLEGE OF DESIGN & ENGINEERING)		Dept Avg by Activity & Level (BIOMEDICAL ENGINEERING-LECTURE (Level 1000))		Fac Avg by Activity & Level (COLLEGE OF DESIGN & ENGINEERING-LECTURE (Level 1000))		Course Average (2410-BN1111-L)	
	Mean	Standard Deviation	Mean	Standard Deviation	Mean	Standard Deviation	Mean	Standard Deviation	Mean	Standard Deviation
What is your overall opinion of the course?	4.1	0.9	4.1	0.9	4.2	0.8	3.9	0.9	4.2	0.8



2. Expected Grade

Distribution of Responses

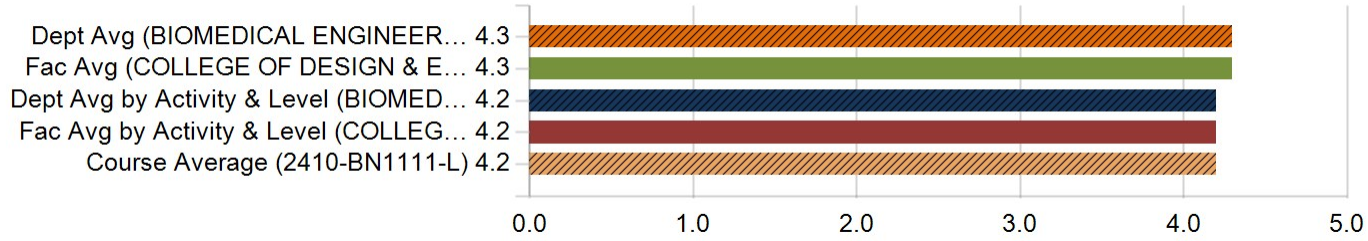
The grade that I am most likely to get in the course is:



Statistics	Value
Response Count	125
Mean	4.2
Standard Deviation	0.6

Rating Scores

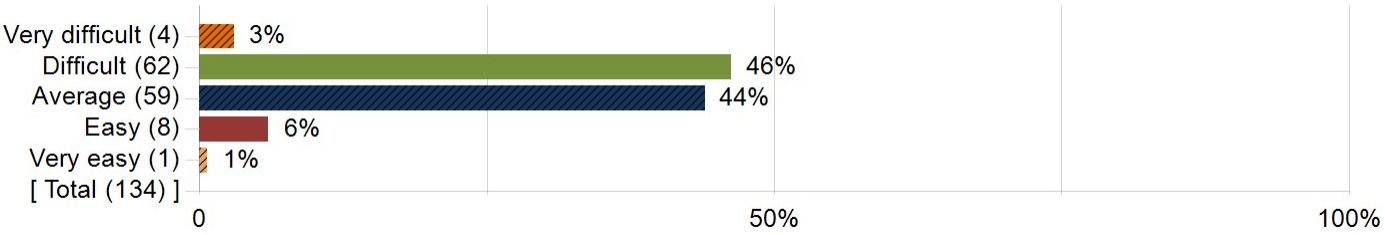
Question	Dept Avg (BIOMEDICAL ENGINEERING)		Fac Avg (COLLEGE OF DESIGN & ENGINEERING)		Dept Avg by Activity & Level (BIOMEDICAL ENGINEERING-LECTURE (Level 1000))		Fac Avg by Activity & Level (COLLEGE OF DESIGN & ENGINEERING-LECTURE (Level 1000))		Course Average (2410-BN1111-L)	
	Mean	Standard Deviation	Mean	Standard Deviation	Mean	Standard Deviation	Mean	Standard Deviation	Mean	Standard Deviation
The grade that I am most likely to get in the course is:	4.3	0.6	4.3	0.6	4.2	0.6	4.2	0.7	4.2	0.6



3. Difficulty Level of the course

Distribution of Responses

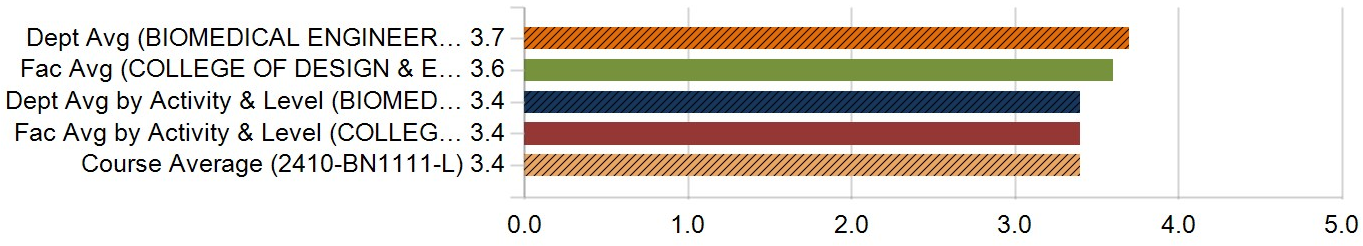
I rate this course as:



Statistics	Value
Response Count	134
Mean	3.4
Standard Deviation	0.7

Rating Scores

Question	Dept Avg (BIOMEDICAL ENGINEERING)		Fac Avg (COLLEGE OF DESIGN & ENGINEERING)		Dept Avg by Activity & Level (BIOMEDICAL ENGINEERING-LECTURE (Level 1000))		Fac Avg by Activity & Level (COLLEGE OF DESIGN & ENGINEERING-LECTURE (Level 1000))		Course Average (2410-BN1111-L)	
	Mean	Standard Deviation	Mean	Standard Deviation	Mean	Standard Deviation	Mean	Standard Deviation	Mean	Standard Deviation
I rate this course as:	3.7	0.8	3.6	0.8	3.4	0.7	3.4	0.7	3.4	0.7



COURSE LEARNING OUTCOMES

1. I am able to describe a complex system using block diagrams and engineering drawings.

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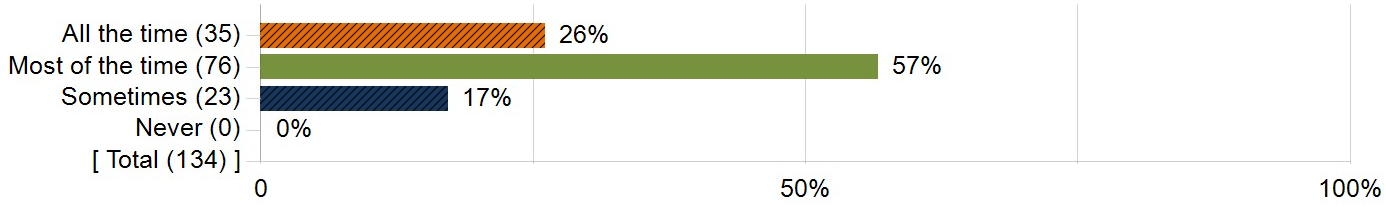

Statistics	Value
Response Count	134
Mean	3.1
Standard Deviation	0.7

2. I am able to analyse the components of a system and predict potential problems.

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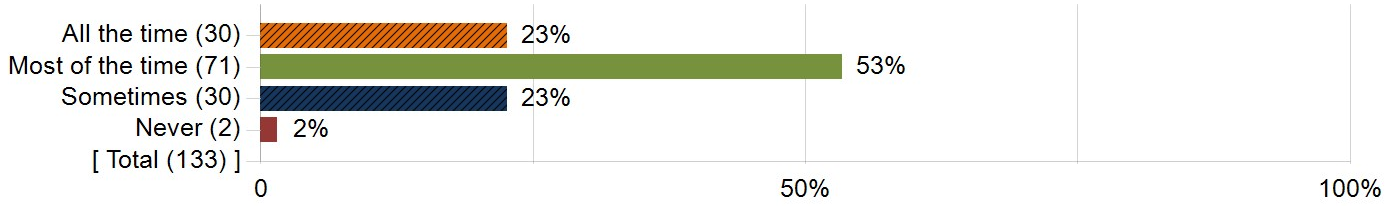
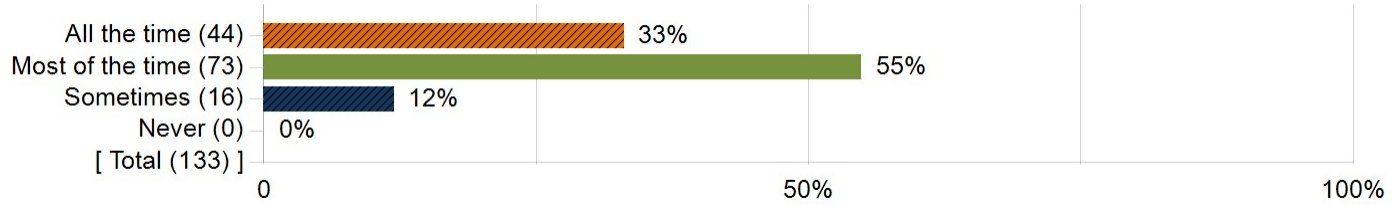


Statistics	Value
Response Count	133
Mean	3.0
Standard Deviation	0.7

3. I am able to design a simple component and fabricate a prototype.

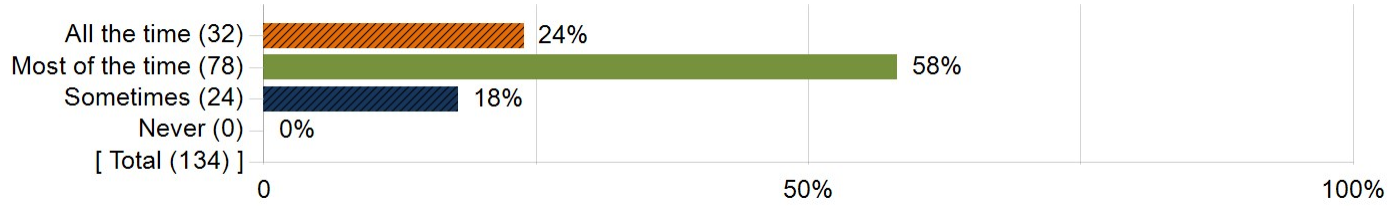
I am able to design a simple component and fabricate a prototype.



Statistics	Value
Response Count	133
Mean	3.2
Standard Deviation	0.6

4. I am able to summarize how a complex biomedical technology works in a clear and concise manner through presentations and reports

I am able to summarize how a complex biomedical technology works in a clear and concise manner through presentations and reports



Statistics	Value
Response Count	134
Mean	3.1
Standard Deviation	0.6

WHAT I LIKE / DISLIKE ABOUT THE COURSE

What I liked about the course

Comments
Very interesting. I liked the solidworks part and how it was taught, very well paced and digestible at every step of the way. The FD part felt fun to be in a lab setting to work on these problems.
Profs were all very interesting :)
fun practical lessons
cool concepts and interesting softwares
I liked the Solidworks portion of the module and found it very interesting. I also liked the group report/ group presentation for Fluid Dynamics.
I liked the part about Solidworks where we get to build the 3D models of medical device.
interesting topics were being taught
That it covered different things – Solidworks and fluid dinamics
I really enjoyed the constant referral to real–life examples and application of the concepts we learn
Engaging module, active learning helps to display raw knowlegde learned in a real–world setting.
I like how this course is a combination of fluid dynamics, with designing and creating sketches, and molding them into 3D design. It

Comments
gives me a new perspective that I have never seen in polytechnic.
broken into two parts into two different semesters —> fresh learning experience
A mix between Solidworks and fluid dynamics gives students more exposure to both spectrums.
This is my first course where AI use is mandated and we have to critique it, very interesting!
practical and getting to learn about the solidworks software
I really enjoyed the Solid Works part of it, as it gave me a glance into the engineering aspect of things.
The course effectively exposed me to a wide range of biomedical skills in year 1, building a strong foundation in the principle of BME, which is design and physiology.
the fluid dynamics related hands on experiments
I learned some basic knowledge of Solidworks and Fluid Mechanics
The ability of using AI for the project.
Interesting
solidworks was relatively fun, fluid dynamics tutorials was interesting
–
usage of AI to further our learning
The content was not too advanced, allowing us to slowly understand each topic
I love the hands–on aspect of the course whereby we as student have the opportunity to sketch and create 3D models of actual medical devices in SolidWorks. I also appreciate the professors' friendliness and their competency to ask all my queries, especially professor Leo Hwa Liang. I also thought that experiments on fluid dynamics were also very interesting and engaging as I am able to visualise what I have learnt on lectures in class.
Very relatable to my major
It teaches very novel concepts and it has an interesting curiculumn
I enjoyed the Solidworks part of the course
solidworks
very interesting content and concepts that are applicable
the content taught was interesting and builds on my existing knowledge
The content of this course is interesting
I like how to course is very comprehensively designed
It addressed Fluid Dynamics and solid works in same course. Solidworks is not something we would usually learn as a course. So thanks for that.
Interesting and engaging with different modes of learning
Hands on and good guidance for the FD part.
I liked that the course is broken down into two halves doing completely different things. I found that the Solidworks part was a nice break from the Fluid Dynamics part and it made the module more interesting in my opinion.
human body stuff
Complex topics are broken down into bit sized to make it easy for our learning and understanding.
I like the mix of solidworks and fluid dynamics, I like how the lectures for fluid dynamics are released before the allocated slots, this really allowed me to understand and process the content.
i enjoyed the solid works portion because it was more handson. In fact, its probably the only tutorial that i have looked forward to all week!
I liked the nature of the course splitting solid works and Fluid Dynamics.
Solidworks and FD experiments
I liked that there were many hands–on aspects of the course, such as the Solidworks component and the various experiments from the Fluid Dynamics component
Learned relevant information. Interesting
interesting content
Only module in year 1 that exposes me to my major
nil
–

Comments
I love solid works it is very innovative and fun
It was eye opening in that we get to explore and learn many different things and apply them in class as well.
Conducted very professionally
Solidworks and drawing were interesting, and FD labs were insightful.
Being the introduction to my biomedical engineering journey, it was fun and makes me want to learn more in subsequent modules.
The integration of AI within the course.
it is interesting
Manageable pace of learning of solidworks
Learning how to use solidworks
Got to start learning about 3D modelling
nil
The fact that there were some fun practical aspects.
The course is very application–based, clearing out theoretical concepts while in–depth explaining how everything works in real life.
informative
It is a straightforward course, learning, and practical skills are explained in detail.
The biomedical knowledge I've learned
Content is interesting, hands on and fun. I love this course.
There’s much resources online.
nil
Report writing and solidworks component
nil
I like the prof who did a good job in explaning all the concepts.
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The modules are own time own target. the videos are relatively clear and easy to refer back to
The divided focus on solidworks and fluid dynamics.
The assignments were relevant and practical, allowing me to apply what I learned in class to real–world situations.
1. lecture videos on solidworks are short and easy to understand 2. all lectures are online
doing the lab work was fun
I learnt something new, and they are useful.
Exposure to software such as Solidworks for designing medical equipment
the pace
solidworks was fun
Solidworks portion was great (but sketching was a bit too rushed), and the fluid dynamics portion is a good idea – very important fundamentals for Engineering.
ability to learn ways to draw using solidworks
I liked learning about SolidWorks and designing Medical Devices.
Everything.
The solidworks professors were engaging, insightful and a pleasure to learn from.
I liked learning new things, especially during lab and for solidworks. It's challenging but still very fun.
SOLIDWORKS is fun for beginners, and the sessions are really useful and easy to follow.

What I disliked about the course

Comments
The timing is very difficult to deal with (Friday afternoon). The FD part could be improved by having the lecturer mention the concepts before we begin the lab sessions, so that we understand how FD is being applied, rather than after.

Comments
The course sometimes doesn't seem to go into depth and is sometimes slow–place. It is understandable that not everybody learns at the same speed, but the slow–pace is sometimes time wasting for those who learn faster. For example, the solidwork section only covers the most basic features over the course of nearly two months, and to learn more I needed to find extra materials and tutorials online. Would like the course more if I learnt more from it.
notes can be improved
sometimes hard to figure out without a guide
The lecture note material were not as clear.
The groupwork is lengthy and unnecessary for fluid dynamics. Individual assignment or projects could replace this
the lack of practices for the fluid dynamics portion of the course
because it covered two different things it felt very touch and go due to its short span
The test itself having questions about specific things that were done in the tutorials. I would have preferred more theoretical or application questions, instead of trying to remember tutorial tasks that were not done by specific group members. (Eg: I did the density tower so I remember that, but having not done the ping pong ball one made it much more difficult to remember)
–
Nil.
lecture notes can be provided for the fd lectures for students to more easily follow.
However, I feel that the time needed for the fluid dynamics project is too much given the 15% weightage, the project has to be downsized to just compare maximum of 3 devices.
NIL
I feel like I didn't get enough practice for the solidworks part, had we had more time with it, I think we could have performed much better
Fluid Dynamic project time constraint made it tougher for the course, otherwise, the overall course plan is well spread out and manageable.
solidworks was slightly too fast paced
There was too little material to cover, and several lectures were even canceled.
NIL
Q ok lah
solidworks is generally ok but fluid dynamics lack practice papers and project felt abit awkward with no template to base off of. Also the online lecture videos can tend to be abit hard to understand due to mic quality
content is quite hard
For the Solidworks and Sketching Test, more time should be given to students
I dislike that the grades for fluid dynamics is never shown/displayed on Canvas. Furthermore, the audio quality of the online lecture of fluid dynamics is poor and have small amount of static noise to it and some material of the lecture seems to be incorrect as well such as about the pitot tube. Also the project deadline of fluid dynamics seems quite rushed.
i like the course
The link between biology and engineering is not present at times, it just seems like the other engineering disciples with bio sprinkled, more explanation for physics topics will be good.
The fluid dynamics was confusing and the content covered in lab sessions vs lectures and what was tested didnt gel well, and the group project information was confusing
that it was conducted before my physics bridging so i was especially unfamiliar with the physics portion in fluid dynamics
some parts are confusing, especially when formulas are introduced
can be abit dry sometimes
NA
The pace as well as scope of content coverage is not very good and clear.
Fluid Dynamics portions were bit dry. The tutorials were quite different from lecture concepts. Could have focused more on circulatory system's anatomy
The use of evaluating AI responses in regards to the group report for Fluid Dynamics section
There wasn't many practises for the SW part, especially for the sketching part. I thought that there could be more guidance and help given to those who are not so strong sketching wise.
I think that there can be more practice questions given especially for the Fluid Dynamics part.

Comments
physics and solidworks... also the lecture quality is quite poor ;–;
Not that I know of.
I feel that the fluid dynamic quiz can have a brief description of the experiments.
i think the lecture notes for fluid dynamics maybe needs abit of work. It was difficult to grasp what is key parts and concepts.
I dislike how condensed the lecture for fluid dynamics is.
Maybe more practice could be given for the Fluid Dynamics component to be able to better prepare for the quiz!
NIL
some topics could be covered more quickly
Nil
The lecturer sometimes caused confusion by using certain terms interchangeably, which led to misunderstandings on my part. For instance, the terms "shear force" and "shear strength" were used as if they were the same, making it hard for me to grasp their distinct meanings. Ultimately, I became so confused by the lectures that I had to watch numerous YouTube videos to gain a clearer understanding of the topics covered.
–
fluid dynamics as it contains a lot of physics and I have yet to complete my physics bridging mod
There was very little time to learn the concepts before being thrown in to apply them, moreover, it felt as though the course is very divided, with different sections being completely different from each other, making it feel like different courses as opposed to one course.
nil
NIL
Lack of material and feedback for testing, made it extremely difficult to study and practice.
fluid dynamics lectures overwhelm with new content that might not even be tested
Fluid dynamics is very content heavy and insufficient practise
The lack of lecture notes that consolidate the points possibly tested in the quiz
Sometimes could be a bit hard for people without prior physics background, some self–learning about physics are expected
nil
Tests and what we studied was nothing similar.
_____
requires more foundational background
Sometimes, the course content consists of material from last year; hence, it isn't updated for this year.
NA
The use of A.I. during the project felt so redundant and added an extra step to my work. Not only do I have to search for prompts and information through CHATGPT I have to go and do more research to verify the answers the AI gives to me. I might as well do my own research for my project and verify it on the spot myself then having to go through A.I. then verifying that the A.I. is correct. What a waste of time.
There were so many videos. I would prefer to compile all the panopto videos into one.
nil
The component on fluid dynamics
nil
NA
–
The online lecture videos – I feel lectures would have been more impactful if they were in–person
More review sessions or Q&A opportunities could have been helpful for clarifying doubts, especially before exams or major assignments.
solidworks test is so hard TT
the closed book test
The lecture are not very clear.
NIL
some materials are not as detailed or enough for the actual test

Comments
fluid dynamics was hard and more practices could be given
The fluid dynamics portion of the course was very messily executed. It was clear that the lectures have not been updated in a few years, and there were poor links made between what was taught in the lecture and lab sessions. The report task was poorly scoped, where it wasn't clear whether the deliverable was a better understanding of medical devices, fluid dynamics, dialysis, or AI, or some mix of all 4. I think this portion of the course has a lot of potential — a task on designing a fluid–dynamics reliant medical device, or even a more technical analysis of the dialysis machines would've been really beneficial in comparison. It is clear that the professors are passionate about the subject matter and have much to share, and we tried our best to gain as much value from them as possible, but it was made difficult with the lack of structure in this portion of the module — I don't believe it's a matter of too much information; rather, a poor compartmentalisation of concepts. I would suggest making the intended learnings for each lab session explicitly clear in the accompanying lesson guides, alongside references to the portion of the lectures we are meant to learn from (and an update to the lectures, e.g. we were quite lost on the pressure diagrams as they weren't well–covered during the lectures or the lab session preambles). More practices for the test would also have been appreciated, as we had little idea of what to expect. I think this course has a lot of potential to inspire future biomedical engineers alongside providing a strong theoretical foundation, but its current implementation still leaves much to be desired, so I hope these suggestions help!
nil
Nil
Nil.
Little to no resources were given in preparation for the FD portion of this module. Only one decent quiz, zero past year papers. FD lectures barely related to the experiments done in labs, which felt akin to primary–secondary school science experiments.
I had a hard time trying to change tutorial classes. I couldn't attend the tutorial class i was preallocated to due to personal reasons. I've tried contacting the professor multiple times but they never gave me any conclusion.
It's quite short, and I feel like I could learn more