6. Dec. 2010.

| 入学年度 | 学科／専攻 | 学科目／課程 | 年次 | 学籍番号 | 28J10028 |
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| | | | | フリガナ | |
| | | | | 氏　名 | Takumi Kubo |

| 科　　目 | 担　当　教　員 |
|---|---|
| | |

Today lecture was some difficult. Prof. Hasegawa and we solved differential equation. First, I tried to solve this one by using differential operator. However, I forgot what is this lecture. ( I had to use Laplace Transformation ). After all, this equation was solve and the solution was obtained. Prof. said, "left hand side of this equation is natural frequency mode, and right hand side is exciting force mode". We are engineer, not mathmatician, so, we must know the phenomena and assume the form of motion.

V.G.

Next Prof. Hasegawa's topic will be "Bode's Diagram" "Nyquist Diagram". Japanese student have already known it. We may have to review and remember.

At first, today's topics was about NASA's discovery. According to the introducer, the findings highen the possibilities that lives out of earth, that is eilien, exist. The interesting point of this news was that when NASA said they had a new big finding, some people in the word thought that this is an anouncement of the discovery of eilian. However, in fact, the discovery was on the earth. I guess many people were disappointed.

V.G.

Then, in the lecture, we solve a differential equation by using Laplace transformation. It was totally mathmatical way. Comparing to the way to assume some equations, it was very difficult for me. But it was good for training my bread. At last we leared the correlation of s-plane and G(s)-plane. Next time, Bode's Diagram and Nyguist Diagram will be introduced.

V.G.

good balance of pre-talk part and the lecture part.

| 入学年度 | 学科／専攻 | 学科目／課程 | 年次 | 学籍番号 | 28J10107 |
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| | | | | フリガナ | 6th Dec 2010 |
| | | | | 氏名 | Erkang Fu |
| 科目 | | | 担当教員 | | |
| | | | | | |

At begining of today's lecture, Mr Yoshida introduced a news from NASA last week. It was about a bacteria which was found in a lake near San Fransisco of U.S. In steady of sulfur which is one of 6 essential elements that a creature need, those bacteria's ~~are consisted~~ consist toxic arsenic (As). This new discovery shows the possibility that scientists may use a new criterion to judge whether there is life exist in planets other than earth. V.G. explanation

And then, professor started instruction with a method of using Laplace Transform to solve problem of differential equation. Without memorizing cumbersome maths formulas, all those kind of problems can be solved step by step.

Finally, a discussion of using a transfer function to transfer a point from S-plane to G(s) plane. Considering cases of ships' motions, rolling ship's, its' response and delay can be represented.

V.G.

| 入学年度 | 学科／専攻 | 学科目／課程 | 年次 | 学籍番号 | 28J10097 |
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| | | | | フリガナ | |
| | | | | 氏名 | Eishi Yoshida |
| 科目 | | | 担当教員 | | |
| | | | Prof. Hasegawa | | |

Summary of 6th Dec

At first of the lecture, I told NASA's topic. But, I didn't know about the detail, and the enough words for explanation. So, I was afraid and wasn't able to do eyecontact with everyone. This is bad manner to communicate. Next, I try to tell doing eye contact. I studied that we should solve the equation not mathmatically but considering the phenomenan.
I studied about the Bode's Diagram and Nyquist Diagram. From these diagram, we can know the relationship between natural angular frequency and transfer function.

V.G.

Talking with mistakes is much much better than silence.

Good attitude, good job!

| 入学年度 | 学科／専攻 | 学科目／課程 | 年次 | 学籍番号 | 28J10083 |
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| | | | | フリガナ | |
| | | | | 氏　名 | Shuji Matsuoka |

| 科　目 | 担　当　教　員 |
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| | |

12/6 Laplace Transform is useful to solve differential equation. To represent phenomenon 2nd differential equation is most important. The solution which is obtained by using Laplace Transformation is easy to understand how the behavior is. We can give some control by using information which is guessed from this form. It is an engineering way.

20

OK. continue this way.
Learn from other students' summary.

Yaseen Adnan Ahmed
28J10108.



Today, we have started with solving differential equation with given initial conditions. We have learnt how to solve such D.E using Laplace Transformation. Again, we also learnt how to guess the solution only by looking the equation, without doing mathematics by identifying the natural frequency term and the exciting force term. We called it like Engineering way to solve.

Then we have started to learn about the tranfer function. If $G(s)$ be the Laplace transform of a system then we can consider. $G(S) = a+ib$, a complex number. But $S = \beta + \omega i$ as we know. So, we can tell that s plane is transformed into $G(s)$ plane and this conversion usually occours one point to one point.

Now, if we consider the $G(s)$ as a complex number, then, we can assume, $\lim_{\omega \to \infty} |G(s)| = \infty$ and $\lim_{\omega \to \infty} \angle G(s) = -\pi/2 + \mathcal{E}$ ; here $\mathcal{E}$ is a very small number. And $\lim_{\omega \to 0} |G(s)| = T$, $\lim_{\omega \to 0} \angle G(s) = 0 - \mathcal{E}_0$; here $\mathcal{E}_0$ is different from $\mathcal{E}$ but both are very small values. For the above assumptions, we consider $G(s) = T/1+Ts$ ;

For plotting $|G|$ vs $\omega$, for $\omega \to \infty$; we need to know Bode's or Nyquist diagram. but $\angle G$ vs $\omega$, for $\omega \to \infty$ can be plotted easily.

Thus, Solving DE and Transfer Function are our key concepts of today's lecture.

O.G.

工学部・工学研究科

12/6 4 28J07089 Ryuma Muramoto 村本隆馬

Today we practiced to solve one differencial equation with Laplace transformation. After we got solution, we learned that we can guess or suppose some part of the solution.
Next lecture was pretty difficult for me but I think that we can use Laplace transformation to change the plane freely (G(s)-plane ⇔ s-plane) and any point or line can be mapped.

Don't be quiet.

Give your question during the lecture.
There should be some (or many) other students who ~~coul~~ couldn't understand.

工学部・工学研究科

Dec. 6th



| 入学年度 | 学科／専攻 | 学科目／課程 | 年次 | 学籍番号 | 28J10111 |
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| | | | | フリガナ | マ チヨン |
| | | | | 氏名 | 馬 沖 |
| 科目 | | | | 担当教員 | |

Remember, there are students who cannot read Chinese or Japanese.

Ma Chong

Today, I learned two kinds of transfer function.

~~Firsty~~ Firstly, I learned how to solve ~~the~~ a ~~system unit~~ vibration system. with external force and system damping by Laplace Transfermation. It is a new ~~metho~~ method for me to ~~solo~~ solve this kind of problem. This method seems relatively easier than usual method ~~and~~ if I was familar with the basic Laplace Transfermation. And the very important ~~characterasti~~ point for this method is that it ~~show~~ can show the ~~in~~ influence of external force and system damping. ~~very sepra~~ seperately and very clearly. Therefore, this method is very ~~si~~ significant for us to analys the ~~du~~ vibration system.

Secondly, I learned a new ~~th~~ transfer Function $G(s)$. For this function, the input parameter is $s$ which is a complex number and output is ~~al also~~ also complex number. Then, we set a simple example for $G(s)$: $G(s) = \frac{T}{1+T \cdot s}$. By asuming $s = i\omega$, we get the characteristic for $G(s)$ when $\omega \to \infty$ and $\omega \to 0$. Then we get the diagram between input $\omega$ and ~~output~~ $|G|$, $\angle G$.

V. good

工学部・工学研究科

28J10101
許広胤
Xu Guang yin

Dec. 6th

Summary of Today's lecture

At today's lecture, we solved a second-order derivative equation which has a meaning of vibration equation for example. I solved it in a mathmatical way before, but from today's lecture we solved it in the way of Laplace transform and inverse Laplace transform. What impressed me was the idea of guessing the form of the solution of such derivative equations at first, for it was meaningful. Then we studied how to use a complex number present a transform function. Also the coordinate system transform. Especially, I found that it is very important to understand the characteristic of complex number coordinate system.

V. G. but ....

Something special (to you) will be most welcome.

工学部・工学研究科

Blandon, Juan

2010/12/6

In today's lecture we saw a differential equation which was presented in the entrance examination for japanese students to this university. It was said, that usually the most common method to solve the differential equation is by using the primitive function $y = ce^{\lambda t}$, however there is a more useful and faster method to do it, and it is using La Place transform; By means of this method we solved the differential equation in a more efficient way. After obtaining the general solution, it was said, that in the case of mathematics, there are some parameters that are needed to solve the equation. However in the case of the engineering field, if we understand the phenomena, we can suppose how the general solution is going to be, in this case the general solution contained sine and cosine terms and also an exponential term, this solution is very similar to the rolling motion of ships, that is why we obtained a cosine in our general solution, it represents the delay of the response of the ship due to the encountering waves. Finally we obtained the response behavior of a system, when in the transfer function, the value of (ω) goes to zero, and to infinity. V.G.

On the case of that D.E., you cannot get the answer directly.
Normally you solve it without R.H.S. part.
Then give specified solution for the R.H.S separately. L.T. method solves it directly without separating the two conditions.

2010.12.6



| 入学年度 | 学科／専攻 | 学科目／課程 | 年次 | 学籍番号 | 28J10105 |
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| | | | | フリガナ | MAO BANGCHENG |
| | | | | 氏　名 | 毛邦成 |

| 科　目 | 担当教員 |
| --- | --- |
| | 長谷川先生 |

Today's lecture is a little difficult for most of us, because it needs much Mathmatics knowledge. I'm so shamed that in fact I learnt it 7 years ago. I remember that I got 89 points finally. But I can only know how to deal with the equation and use the Mathmatics to get the result before. Now, I get it clearly.

Professor starts the lecture with a question of this year's master entrance examination. It looks like only a math question but we do it together and finally I find it has exact relation to our major, especially it is close to our lecture that is the control system. Now I know why we must do so much dificult and boring math works. And I know how to use the transfer function to get the tendency of amplitude and phase.

But only this method is not enough, we must use Bodo's Diagram and Nyquist Diagram to analyse it clearly. I think that is our next lecture's content and I must prepare it!

V.G.

Impact and Shame. are very important!

 12/6

28J10004 Yuto Ito

First, Eishi told us the news about a new life. It was interesting.
Next, in the lecture by Prof. Hasegawa, we solved a differential equation.
I had forgot the way though I learned it in the undergraduate course.
Prof. Hasegawa said that supposing the solution is more important than calculating it mathematically.
We should suppose it by using a diagram.
Then, we learned about "Transfer Function", $G(s)$.
We solved the limit of $|G(s)|$ and $\angle G(s)$.

good.

In this lecture, we began with a application of Laplace trasformation in mathtical problem which aims to solve the 2nd ordinary derivative equation. I learnt this method for the first time. "how incredible it is! and what a coincidence it is!" I thought when I learnt we can also use Laplace transformation to solve such problems, thought, we must be familiar with the formula and the results should also be able to be transfered by Laplace traformation.

After the review of Laplace trasformation, we proceed to focus on Transfer Function. We can see if we give w into infinit, the absolut value of G(s) tends to infinit, on the other hand, the angle of G(s) tends to $(-\frac{\pi}{2}+\varepsilon)$, which means there is always a small positive deviation to $-\frac{\pi}{2}$. And the absolut value tends to T, angle of G(s) tends to $(0-\varepsilon)$, when w tends to 0.

I really think our lecture is going on smothly, and I am keeping the pace with others well. After the lecture, I will have a good review of what we learnt today.

Very good!

Yu Lubin
28/10/03
06/12