

(For JSPS Fellow)

Form B-5

Date (日付)

26/5/2014 (Date/Month/Year:日/月/年)

Activity Report -Science Dialogue Program-
(サイエンス・ダイアログ事業 実施報告書)

- Fellow's name (講師氏名): Johan Shu-Ren Hysing (ID No. P13780)
- Participating school (学校名): Tsuru High School
- Date (実施日時): 23/5/2014 (Date/Month/Year:日/月/年)
- Lecture title (講演題目): (in English) Mathematical modeling and simulation for engineering
(in Japanese)
- Lecture summary (講演概要): Please summary your lecture 200-500 words.

This is a two part lecture, one part presenting Sweden and illustrating some differences between Japan and Sweden, and one part presenting mathematical modeling and computer simulation for engineering design. The main part of the presentation deals with how mathematical models can be used to try to predict, optimize, and analyze problems involving various physical phenomena, such as fluid flow, heat transfer, and structural stresses which can be found in many different engineering applications. We start by discussing how mathematics have evolved and now allow us to change from a "trial and error" based design paradigm to a more "predictive" way to approach engineering design. Two examples of past engineering failures illustrate just how the "trial and error" approach can lead to very costly and disastrous consequences, the Swedish Vasa warship and the Tacoma Narrows bridge, both of which failed a short time after being completed. The presentation then moves on to discuss modern engineering design with computer simulations and tries to briefly explain the underlying mathematical concepts and ideas that make it possible to make good and accurate predictions of our world.

- Language used (使用言語): English
- Lecture format (講演形式):
 - ◆Lecture time (講演時間) 90 min (分), Q&A time (質疑応答時間) 15 min (分)
 - ◆Lecture style (ex.: used projector, conducted experiments)
 (講演方法 (例: プロジェクター使用による講演、実験・実習の有無など))
PPT presentation with projector
 - ◆Interpretation (ex.: assistance by accompanied person, provided Japanese explanation by yourself) (通訳 (例: 同行者によるサポート、講師本人による日本語説明))
Some assistance from teacher

◆Name and title of accompanied person (同行者 職・氏名)

Eiichi Kazama

◆Other note worthy information (その他特筆すべき事項):

- Impressions and opinions from accompanied person (同行者の方から、本事業に対する意見・感想等
がありましたら、お願いいたします。):