

**Department of Aeronautics and Astronautics**  
**School of Engineering**

Hongo 7-3-1, Bunkyo-ku, Tokyo, 113-8656, JAPAN

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To whom it may concern,

Comments as to the Curriculum Design in al-Farabi Kazakh National University

First of all, I am very glad and honored to review the curriculum developed by your university. By comparing it with the curriculum in our University of Tokyo, I would like to make some comments as follows;

**1. Overview**

In overall structure, the curriculum is well designed, which covers the broad important areas for mechanics including the following categorized topics;

- 1) Liberal arts: language, history, philosophy, etc.
- 2) Basic knowledge and skills which are indispensable for discipline of mechanics, such as mathematics, chemistry, physics, etc. (dark blue part)
- 3) Lectures related to basic literacy such as CAD/CAM, software, circuits, etc.
- 4) Disciplinary lectures (including “core” and “major” disciplines) specialized for mechanics, such as dynamics of solid bodies, thermodynamics, strength of materials, fluid mechanics, dynamic systems, etc. (light blue and dark green part)
- 5) Elective lectures which can provide additional knowledge and skills for different research (light green part)

As to each categorized topic, I would like to give comments in the following chapters.

**2. Comments to Each Category**

- 1) “Foreign language” to be taught had better be English. And in “Kazakh (Russian) language,” Russian speaking students should take Kazakh language and vice versa, right? Usually in addition to English, one another language as “2<sup>nd</sup> Foreign Language” is taught in many countries like USA and Japan. It will broaden the view of the students. So I would recommend to have 2<sup>nd</sup> foreign language lecture.

- 2) Mathematics seem to cover almost all the important areas. Physics, for which no detailed information is provided, should include basic dynamics of rigid body, electrics and magnetics, as the obligatory components.
- 3) CAD/CAM had better be included in obligatory components because this is required in almost all the research areas. Basic lectures on software should also be prepared as an obligatory component.
- 4) The subjects cover all the areas required in mechanics and aerospace engineering, and so I don't have any special comments. Please check that the following topics, which are required for general mechanical system, are included in some lectures; structure strength, link mechanism, optimization theory, etc. Control theory is now included in light green part, but had better be included in light blue part (elective components of core disciplines).
- 5) I would like to give comments on elective components on aerospace engineering;
  - Satellite attitude dynamics and control, spacecraft systems and design had better be prepared in the light green part. Lecture on spacecraft systems and design should include practice of satellite conceptual design.

### 3. General Comments

- Hands-on experiment had better be prepared as an obligatory component, which includes structure and material related experiments, electrics related experiments, control and software related experiments, etc.
- For each group of students who are targeting for different research areas, it would be better to show "typical menu for the specified research field" so that students can take pre-designed series of lectures efficiently.

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- In the 8<sup>th</sup> semester, I guess that students will conduct research for graduation thesis. It would be better that students can pursue not only pure research but also hands-on projects (such as developing some robots or miniature satellites), because such expertise as “to develop something” will sometimes be required for students who will go into industry.
- When to teach “Technical Writing” had better be considered. In 8<sup>th</sup> semester, it would be better to make students fully focus on research or project. If possible, it would be better to include lecture on improving presentation skills. If the load of this lecture is very small, it would be no problem to have it in 8<sup>th</sup> semester. If not, it would be better to have it in 7<sup>th</sup> semester.

Best Regards,



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