科目ナンバリング	U-LAS12 10015 LE57						
授業科目名 <英訳>	Advanced Dynamics Advanced Dynamics			担当者所属 職名・氏名	工学研究科　准教授　KIM, SUNMIN		
群	自然科学科目群		分野(分類)	物理学(基礎)		使用言語	英語
旧群	B群	単位数	2単位	週コマ数	1コマ	授業形態	講義（対面授業科目）
開講年度・開講期	2026・後期	曜時限	火3	配当学年	主として1回生	対象学生	理系向

[授業の概要・目的]

This course deals with the mechanics of rigid body based on Newton's mechanics. Description of motion of rigid bodies and related applications will be explained in detail.

[到達目標]

To understand various dynamic topics comprehensively based on many practical examples and problems

[授業計画と内容]

The main topics in this lecture are as follows;
(Each items will be covered by 2-3 weeks)

1. Curvilinear motion of a particle [1 week]
- Rectangular components, normal and tangential components, cylindrical components
2. Planer motion of a rigid body [2 weeks]
- Translation, rotation about a fixed axis, relative motion analysis using rotating axes
3. General motion of a rigid body [2 weeks]
- The time derivative of a vector in a rotating reference frame
4. Force and energy of a rigid body [3 weeks]
- Mass moment of inertia, equations of motion, principle of work and energy, conservation of energy
5. Impulse and momentum of a rigid body [3 weeks]
- Linear and angular momentum, impact, principle of impulse and momentum, conservation of momentum
6. Three dimensional motion analysis [3 weeks]
- Moments and products of inertia, equations of motion, gyroscopic motion
7. Final Examination
8. Feedback [1 week]

[履修要件]

Having taken the course"Fundamental Physics A" is recommended.

[成績評価の方法・観点]

Evaluation is based on assignments (40%) and written tests (final exam: 60%).

[教科書]

使用しない
Some handout materials will be provided during the class.

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Advanced Dynamics(2)

[参考書等]

（参考書）

R. C. Hibbeler 『Dynamics』（Prentice Hall）ISBN:978-0-13-291127-6（very well organized textbook with abundant examples）

[授業外学修（予習・復習）等]

Self-review is strongly recommended after each lecture.

[その他（オフィスアワー等）]

No specific office hour. Email communication is preffered through [kim.sunmin.6x@kyoto-u.ac.jp].

[主要授業科目（学部・学科名）]

理学部