Course Numbering	TMA-MEE213E
Year	Second semester 2025
Subject (J)	Mechnical Vibration I
Subject	(IMAC-U)Mechanical Vibrations I
Credit(s)	2Credits
Instructor	FEDORYNENKO DMYTRO,MITSUHIRO HAYASHIBE
Media Class Subjects	
Essential Subjects	○
Language of Instruction	
Course Objectives and Summary/ Learning Goals (J)	Google Classroomのクラスコードは工学部Webページにて確認すること。 学部シラバス・時間割(https://www.eng.tohoku.ac.jp/edu/syllabus-ug.html) １．Class subject(目的) To acquire fundamental knowledge regarding dynamic problems which may arise in machinery. ２． Object and summary of class(概要) To learn dynamic characteristics of the systems with one, two, and multi degrees of freedom obtained by modeling machinery. ３． Goal of the study(達成目標等) To acquire the ability to apply the knowledge obtained in this class to engineering design.
Course Objectives and Summary/ Learning Goals	The class code for Google Classroom can be found on the Web site of the School of Engineering: https://www.eng.tohoku.ac.jp/edu/syllabus-ug.html (JP Only) １． Class subject To acquire fundamental knowledge regarding dynamic problems which may arise in machinery. ２． Object and summary of class To learn dynamic characteristics of the systems with one, two, and multi degrees of freedom obtained by modeling machinery. ３． Goal of the study To acquire the ability to apply the knowledge obtained in this class to engineering design.
Relevance to Other Subjects/Considerations for Taking the Class (J)	
Relevance to Other Subjects/Considerations for Taking the Class	Fundamental knowledge of Mathematics and Mechanics is required.
Course Description (J)	
Course Description	1. Introduction, vibration basics, and fundamental mathematics 2. Free vibrations of systems with one degree of freedom: vibration of an undamped system (I) 3. Free vibrations of systems with one degree of freedom: vibration of an undamped system (II) 4. Free vibrations of systems with one degree of freedom: vibration of an undamped system (III) 5. Free vibrations of systems with one degree of freedom: vibrations with viscous damping 6. Free vibrations of systems with one degree of freedom: vibrations with viscous, Coulomb, and hysteretic damping 7. Forced vibrations of systems with one degree of freedom (I) 8. Forced vibrations of systems with one degree of freedom (II) 9. Free vibrations of systems with two degrees of freedom (I) 10. Free vibrations of systems with two degrees of freedom (II) 11. Forced vibrations of systems with two degrees of freedom 12. Vibrations of multidegree-of-freedom systems (I) 13. Vibrations of multidegree-of-freedom systems (II) 14. Summary 15. Final examination
Preparation and Review(J)	生徒は各クラスを1～2時間勉強する必要があります。 理解できない部分が残っている場合は、質問すたほうがいいです。
Preparation and Review	Students are required to review each class for one to two hours. If there remain any parts they cannot understand, they should ask questions.

Evaluation methods and criteria (J)	
Evaluation methods and criteria	Students are evaluated on the in-class assignments they perform and the final exam. The in-class assignments are given to students at the end of each lecture. The coverage of the assignments corresponds to the contents of the previous class. Students must solve the given problems within 15 minutes and then hand them in at the end of the lecture. Grading policy: solving in-class mini-tests - 30%; final examination - 70%.

Textbooks and references

Title	Author	Publisher	Year	ISBN/ISSN	Classification
Mechanical Vibrations SI (5th Edition)	S. S. Rao	Pearson Education	2011	9789810687120	reference
Mechanical Vibrations	S. G. Kelly	Schaum's Outline Series	1996	0070340412	reference
An Introduction to Mechanical Vibrations, (3rd Edition)	R. F. Steidel, Jr.	Wiley	1989	0471845450	reference

URL	Google Classroom is planned to be used as a course LMS. Google Classroom: [TB14025] (IMAC-U) Mechanical Vibrations I 2024; class code is lcym7ea
Attached File	
Office Hours(J)	Usually, office hours are arranged individually upon request. Please get in touch with the course instructor by email.
Office Hours	
Contact： Please insert '@' in the email address.	fedorynenko.dmytro.b3@tohoku.ac.jp
Notes	The course is organized without a specific textbook. Instead, handouts and presentations for each lecture are supposed to be used. Some reference books can be borrowed from the IMAC library (Room 330, Mechanics Building 2 (A03), Aobayama Campus).
Practical Skill/Hands-on Class	
Other Comments/Instructions	
Last Update	2024/02/07 16:00:54

One-credit courses require 45 hours of study. In lecture and exercise-based classes, one credit consists of 15-30 hours of class time and 30-15 hours of preparation and review outside of class. In laboratory, practical skill classes, one credit consists of 30-45 hours of class time and 15-0 hours of preparation and review outside of class.