Advanced Applied Dynamics of Machine

2 units (selection)

Junichi Hino · Professor / Intelligent Machines, Mechanical Engineering, Intelligent Structures and Mechanics Systems Engineering

Target⟩ The basic technologies which evaluate and control dynamic behavior of mechnical systems and their applied technologies are made to master.

Outline⟩ The theoretical and experimental modal analysis methods to grasp dynamic properties of structures and derive mathematical models are studied. In recent vibration analysis, the vibration analysis procedures with computers are of increasing mportance. The algorithms to solve eignevalue problems and numerical Integration methods of ordinary differential equations are introduced. Subsequently, active and passove vibration control methods of mechanical systems are studied are lectured.

Style⟩ Lecture

Keyword⟩ *vibration analysis, modal analysis, vibration control*

Requirement⟩ Students are required to have a good understanding of undergraduate-level appied mechancs and related subjects.

Goal⟩
1. To understand dynamic design method
2. To understand modal analysis
3. To aqcuire computer vibration analysis precedure
4. To understand vibration control method

Schedule⟩
1. Modeling of mechanical systems
2. Formulation of mechanical systems
3. Natural frequencies and mode shapes
4. Eigenvalue problem and solution
5. Computational analysis of mechanical systems; Runge Kutta Method
6. Computational analysis of mechanical systems; Newmark Method
7. Experimrntal modal analysis; Vibration testing
8. Experimrntal modal analysis Modal identification; SDOF Merhod
9. Experimrntal modal analysis Modal identification; MDOF Method
10. Active and passive control methods
11. Vibration control with a dynamic absorber
12. Vibration control and state equation
13. Vibration control, pole placement method
14. Vibration control, observer
15. Vibration control, optimal control
16. Examination

Evaluation Criteria⟩ Assignments count 50% and examinations count 50%

Textbook⟩
◇ Printed synopses are used.
◇ To be introduced in thte class

Reference⟩ To be introduced in thte class

Contents⟩ http://cms.db.tokushima-u.ac.jp/cgi-bin/toURL?EID=216706

Student⟩ Able to be taken by only specified class(es)

Contact⟩
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