ME 588 Dynamics and Vibrations Fall 2007

MEB 307, 543-5628 reinhall@u.washington.edu Text: Principles and Techniques of Vibrations L. Meirovitch, Prentice Hall Website: http://faculty.washington.edu/reinhall/ Course Objectives: This is an introductory graduate course in dynamics and vibrations. At the end of the quarter you will be familiar with Newtonian and Lagrangian dynamics and a wide range of analytical and approximate tools for the analysis of linear discrete mass and continuous systems. Topics to be covered: Review of linear and nonlinear dynamics Newtonian and Lagrangian dynamics Newtonian and Lagrangian dynamics Newton's 2 ^{m/} law Work and energy Virtual work Calculus of variation Stability Hamilton's principle Lagrange equation of motion Vibration of single degree of freedom systems Free vibration Danping Porced vibration Isolation Vibration control Vibration control Vibration control Vibration control Vibration control Noise from vibrating panels Approximate methods Galerkin / Rayleigh Ritz Method Final: 50% (Nev 9) Image: Smile Simplemethods	Instructor:	Per Reinhall
 Text: Principles and Techniques of Vibrations L. Meirovitch, Prentice Hall Website: http://faculty.washington.edu/reinhall/ Course Objectives: This is an introductory graduate course in dynamics and vibrations. At the end of the quarter you will be familiar with Newtonian and Lagrangian dynamics and a wide range of analytical and approximate tools for the analysis of linear discrete mass and continuous systems. Topics to be covered: Review of linear and nonlinear dynamics Newton's 2nd law Work and energy Virtual work Calculus of variation Stability Hamilton's principle Lagrange equation of motion Vibration of single degree of freedom systems Free vibration Damping Forced Vibration Vibration of two and multi degree of freedom systems Free and Forced Vibration Vibration control Vibration control Vibration control Vibration control Vibration control Noise from vibrating panels Approximate methods Galerkin / Rayleigh Ritz Method Final: 50% (Dec 11, 2:30-4:30 pm) 		MEB 307, 543-5628
L. Meirovitch, Prentice Hall Website: http://faculty.washington.edu/reinhall/ Course Objectives: This is an introductory graduate course in dynamics and vibrations. At the end of the quarter you will be familiar with Newtonian and Lagrangian dynamics and a wide range of analytical and approximate tools for the analysis of linear discrete mass and continuous systems. Topics to be covered: Review of linear and nonlinear dynamics Newtonian and Lagrangian dynamics Newton's 2 nd law Work and energy Virtual work Calculus of variation Stability Hamilton's principle Lagrange equation of motion Vibration of single degree of freedom systems Free vibration Jamping Forced vibration Isolation Vibration control Vibration of two and multi degree of freedom systems Free and Forced Vibration Vibration control Vibration of two and multi degree of freedom systems Strings, rods, beams, plates Vibration control Noise from vibrating panels Approximate methods Galerkin / Rayleigh Ritz Method Finite element analysis Grading: Midterm: 25% (Nov 9)		
Website: http://faculty.washington.edu/reinhall/ Course Objectives: This is an introductory graduate course in dynamics and vibrations. At the end of the quarter you will be familiar with Newtonian and Lagrangian dynamics and a wide range of analytical and approximate tools for the analysis of linear discrete mass and continuous systems. Topics to be covered: Review of linear and nonlinear dynamics Newtonian and Lagrangian dynamics Newton's 2 nd law Work and energy Virtual work Calculus of variation Stability Hamilton's principle Lagrange equation of motion Vibration of single degree of freedom systems Free vibration Damping Forced vibration Stabilitor Vibration control Vibration of two and multi degree of freedom systems Free and Forced Vibration Vibration of two and multi degree of freedom systems Strings, rods, beams, plates Vibration control Vibration control Vibration control Noise from vibrating panels Approximate methods Galerkin / Rayleigh Ritz Method Final: 50% (Dec 11, 2:30-4:30 pm) Fre	Text:	
 Course Objectives: This is an introductory graduate course in dynamics and vibrations. At the end of the quarter you will be familiar with Newtonian and Lagrangian dynamics and a wide range of analytical and approximate tools for the analysis of linear discrete mass and continuous systems. Topics to be covered: Review of linear and nonlinear dynamics Newtonian and Lagrangian dynamics Newtonian and Lagrangian dynamics Newton's 2nd law Work and energy Virtual work Calculus of variation Stability Hamilton's principle Lagrange equation of motion Vibration of single degree of freedom systems Free vibration Damping Forced vibration Isolation Vibration control Vibration control Noise from vibrating panels Approximate methods Galerkin / Rayleigh Ritz Method Finie element analysis Grading: Midterm: 25% (New 9) (Dec 11, 2:30-4:30 pm)		
 This is an introductory graduate course in dynamics and vibrations. At the end of the quarter you will be familiar with Newtonian and Lagrangian dynamics and a wide range of analytical and approximate tools for the analysis of linear discrete mass and continuous systems. Topics to be covered: Review of linear and nonlinear dynamics Newtonian and Lagrangian dynamics Newton's 2nd law Work and energy Virtual work Calculus of variation Stability Hamilton's principle Lagrange equation of motion Vibration of single degree of freedom systems Free vibration Damping Forced vibration Isolation Vibration control Noise from vibrating panels Approximate methods Galerkin / Rayleigh Ritz Method Final: 50% (New 2) (Dec 11, 2:30-4:30 pm) 		
end of the quarter you will be familiar with Newtonian and Lagrangian dynamics and a wide range of analytical and approximate tools for the analysis of linear discrete mass and continuous systems. Topics to be covered: Review of linear and nonlinear dynamics Newtonian and Lagrangian dynamics Newton's 2 nd law Work and energy Virtual work Calculus of variation Stability Hamilton's principle Lagrange equation of motion Vibration of single degree of freedom systems Free vibration Damping Forced vibration Isolation Vibration control Vibration of two and multi degree of freedom systems Free and Forced Vibration Vibration control Vibration control Vibration Soft continuous systems Strings, rods, beams, plates Vibration control Noise from vibrating panels Approximate methods Galerkin / Rayleigh Ritz Method Finite element analysis Grading: Midterm: 25% (Nov 9)	Course Objectives:	
dynamics and a wide range of analytical and approximate tools for the analysis of linear discrete mass and continuous systems. Topics to be covered: Review of linear and nonlinear dynamics Newtonian and Lagrangian dynamics Newton's 2 nd law Work and energy Virtual work Calculus of variation Stability Hamilton's principle Lagrange equation of motion Vibration of single degree of freedom systems Free vibration Damping Forced vibration Isolation Vibration control Vibration of two and multi degree of freedom systems Free and Forced Vibration Vibration control Vibration control Vibration control Vibration control Vibration control Vibration control Noise from vibrating panels Approximate methods Galerkin / Rayleigh Ritz Method Finite element analysis Grading: Midterm: 25% (Nov 9) → Final: 50% (Dec 11, 2:30-4:30 pm)		
analysis of linear discrete mass and continuous systems. Topics to be covered: Review of linear and nonlinear dynamics Newtonian and Lagrangian dynamics Newton's 2 nd law Work and energy Virtual work Calculus of variation Stability Hamilton's principle Lagrange equation of motion Vibration of single degree of freedom systems Free vibration Damping Forced vibration Isolation Vibration control Vibration of two and multi degree of freedom systems Free and Forced Vibration Vibration Control Vibration Control Vibration Control Vibration control Noise from vibrating panels Approximate methods Galerkin / Rayleigh Ritz Method Finite element analysis Grading: Midterm: 25% (Nov 9)		
Topics to be covered: Review of linear and nonlinear dynamics Newtonian and Lagrangian dynamics Newton's 2 nd law Work and energy Virtual work Calculus of variation Stability Hamilton's principle Lagrange equation of motion Vibration of single degree of freedom systems Free vibration Damping Forced vibration Isolation Vibration control Vibration of two and multi degree of freedom systems Free and Forced Vibration Vibration control Noise from vibrating panels Approximate methods Galerkin / Rayleigh Ritz Method Finite element analysis		
 Review of linear and nonlinear dynamics Newtonian and Lagrangian dynamics Newton's 2nd law Work and energy Virtual work Calculus of variation Stability Hamilton's principle Lagrange equation of motion Vibration of single degree of freedom systems Free vibration Damping Forced vibration Isolation Vibration control Vibration of two and multi degree of freedom systems Free and Forced Vibration Vibration control Noise from vibrating panels Approximate methods Galerkin / Rayleigh Ritz Method Final: 50% (Nov 9) 		•
 Newtonian and Lagrangian dynamics Newton's 2nd law Work and energy Virtual work Calculus of variation Stability Hamilton's principle Lagrange equation of motion Vibration of single degree of freedom systems Free vibration Damping Forced vibration Isolation Vibration control Vibration control Vibration of two and multi degree of freedom systems Free and Forced Vibration Vibration control Vibrations of continuous systems Strings, rods, beams, plates Vibration control Vibration control Noise from vibrating panels Approximate methods Galerkin / Rayleigh Ritz Method Finite element analysis Grading: Midterm: 25% (Nov 9) Final: 50% (Dec 11, 2:30-4:30 pm) 		
 Newton's 2nd law Work and energy Virtual work Calculus of variation Stability Hamilton's principle Lagrange equation of motion Vibration of single degree of freedom systems Free vibration Damping Forced vibration Isolation Vibration control Vibration of two and multi degree of freedom systems Free and Forced Vibration Vibrations of continuous systems Strings, rods, beams, plates Vibration control Noise from vibrating panels Approximate methods Galerkin / Rayleigh Ritz Method Finit: 25% (Nov 9) Final: 50% (Dec 11, 2:30-4:30 pm) 		
 Work and energy Virtual work Calculus of variation Stability Hamilton's principle Lagrange equation of motion Vibration of single degree of freedom systems Free vibration Damping Forced vibration Isolation Vibration control Vibration of two and multi degree of freedom systems Free and Forced Vibration Vibration Control Vibrations of continuous systems Strings, rods, beams, plates Vibration control Noise from vibrating panels Approximate methods Galerkin / Rayleigh Ritz Method Finite element analysis 		Newtonian and Lagrangian dynamics
Virtual work Calculus of variation Stability Hamilton's principle Lagrange equation of motion Vibration of single degree of freedom systems Free vibration Damping Forced vibration Isolation Vibration control Vibration of two and multi degree of freedom systems Free and Forced Vibration Vibration control Vibration Control Vibrations of continuous systems Strings, rods, beams, plates Vibration control Noise from vibrating panels Approximate methods Galerkin / Rayleigh Ritz Method Final: 50% (Nov 9)		
Calculus of variation Stability Hamilton's principle Lagrange equation of motion Vibration of single degree of freedom systems Free vibration Damping Forced vibration Isolation Vibration control Vibration of two and multi degree of freedom systems Free and Forced Vibration Vibration Control Vibrations of continuous systems Strings, rods, beams, plates Vibration control Noise from vibrating panels Approximate methods Galerkin / Rayleigh Ritz Method Finite element analysis Grading: Midterm: 25% (Nov 9)		
Stability Hamilton's principle Lagrange equation of motionVibration of single degree of freedom systems Free vibration Damping Forced vibration Isolation Vibration controlVibration of two and multi degree of freedom systems Free and Forced Vibration Vibration ControlVibration of two and multi degree of freedom systems Free and Forced Vibration Vibration ControlVibration controlVibration of two and multi degree of freedom systems Free and Forced Vibration Vibration ControlVibration controlVibrations of continuous systems Strings, rods, beams, plates Vibration control Noise from vibrating panels Approximate methods Galerkin / Rayleigh Ritz Method Finite element analysisGrading:Midterm: 25% (Nov 9) (Internet 250 (Dec 11, 2:30-4:30 pm))		
 Hamilton's principle Lagrange equation of motion Vibration of single degree of freedom systems Free vibration Damping Forced vibration Isolation Vibration control Vibration of two and multi degree of freedom systems Free and Forced Vibration Vibration Control Vibrations of continuous systems Strings, rods, beams, plates Vibration control Noise from vibrating panels Approximate methods Galerkin / Rayleigh Ritz Method Finite element analysis 		
Lagrange equation of motion Vibration of single degree of freedom systems Free vibration Damping Forced vibration Isolation Vibration control Vibration of two and multi degree of freedom systems Free and Forced Vibration Vibration Control Vibrations of continuous systems Strings, rods, beams, plates Vibration control Noise from vibrating panels Approximate methods Galerkin / Rayleigh Ritz Method Finite element analysis Grading: Midterm: 25% (Nov 9)		•
 Vibration of single degree of freedom systems Free vibration Damping Forced vibration Isolation Vibration control Vibration of two and multi degree of freedom systems Free and Forced Vibration Vibration Control Vibrations of continuous systems Strings, rods, beams, plates Vibration control Noise from vibrating panels Approximate methods Galerkin / Rayleigh Ritz Method Finite element analysis Grading: Midterm: 25% (Nov 9)		• •
Free vibration Damping Forced vibration Isolation Vibration control Vibration of two and multi degree of freedom systems Free and Forced Vibration Vibration Control Vibrations of continuous systems Strings, rods, beams, plates Vibration control Noise from vibrating panels Approximate methods Galerkin / Rayleigh Ritz Method Finite element analysis		
Damping Forced vibration Isolation Vibration control Vibration of two and multi degree of freedom systems Free and Forced Vibration Vibration Control Vibrations of continuous systems Strings, rods, beams, plates Vibration control Noise from vibrating panels Approximate methods Galerkin / Rayleigh Ritz Method Finite element analysis Grading: Midterm: 25% (Nov 9)		
 Forced vibration Isolation Vibration control Vibration of two and multi degree of freedom systems Free and Forced Vibration Vibration Control Vibrations of continuous systems Strings, rods, beams, plates Vibration control Noise from vibrating panels Approximate methods Galerkin / Rayleigh Ritz Method Finite element analysis Grading: Midterm: 25% (Nov 9) Final: 50% (Dec 11, 2:30-4:30 pm) 		
Isolation Vibration control Vibration of two and multi degree of freedom systems Free and Forced Vibration Vibration Control Vibrations of continuous systems Strings, rods, beams, plates Vibration control Noise from vibrating panels Approximate methods Galerkin / Rayleigh Ritz Method Finite element analysis		
Vibration control Vibration of two and multi degree of freedom systems Free and Forced Vibration Vibration Control Vibrations of continuous systems Strings, rods, beams, plates Vibration control Noise from vibrating panels Approximate methods Galerkin / Rayleigh Ritz Method Finite element analysis Grading: Midterm: 25% (Nov 9)		
 Vibration of two and multi degree of freedom systems Free and Forced Vibration Vibration Control Vibrations of continuous systems Strings, rods, beams, plates Vibration control Noise from vibrating panels Approximate methods Galerkin / Rayleigh Ritz Method Finite element analysis Grading: Midterm: 25% (Nov 9) (Nov 9) 		
 Free and Forced Vibration Vibration Control Vibrations of continuous systems Strings, rods, beams, plates Vibration control Noise from vibrating panels Approximate methods Galerkin / Rayleigh Ritz Method Finite element analysis Grading: Midterm: 25% (Nov 9) Final: 50% (Dec 11, 2:30-4:30 pm) 		
Vibration Control Vibrations of continuous systems Strings, rods, beams, plates Vibration control Noise from vibrating panels Approximate methods Galerkin / Rayleigh Ritz Method Finite element analysis Grading: Midterm: 25% (Nov 9)		
 Vibrations of continuous systems Strings, rods, beams, plates Vibration control Noise from vibrating panels Approximate methods Galerkin / Rayleigh Ritz Method Finite element analysis Grading: Midterm: 25% (Nov 9) Final: 50% (Dec 11, 2:30-4:30 pm) 		
 Strings, rods, beams, plates Vibration control Noise from vibrating panels Approximate methods Galerkin / Rayleigh Ritz Method Finite element analysis Grading: Midterm: 25% (Nov 9) Final: 50% (Dec 11, 2:30-4:30 pm)		
 Vibration control Noise from vibrating panels Approximate methods Galerkin / Rayleigh Ritz Method Finite element analysis Grading: Midterm: 25% (Nov 9) Final: 50% (Dec 11, 2:30-4:30 pm) 		•
 Noise from vibrating panels Approximate methods Galerkin / Rayleigh Ritz Method Finite element analysis Grading: Midterm: 25% (Nov 9) Final: 50% (Dec 11, 2:30-4:30 pm) 		0
Approximate methods Galerkin / Rayleigh Ritz Method Finite element analysis Grading: Midterm: 25% (Nov 9)		
Galerkin / Rayleigh Ritz Method Finite element analysis Grading: Midterm: 25% (Nov 9)		
Finite element analysis Grading: Midterm: 25% (Nov 9) Image: Final: 50% (Dec 11, 2:30-4:30 pm)		
Grading: Midterm: 25% (Nov 9)		• •
Final: 50% (Dec 11, 2:30-4:30 pm) $-$	rinne element analysis	
	Grading:	Final: 50% (Dec 11, 2:30-4:30 pm) $-$