

Instructor: Uwe Thumm

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Office hours: by appointment

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Text book: Goldstein, Poole, and Safko, 'Classical Mechanics', 3rd edition (Addison-Wesley 2002)

Supplementary books (not required):

Basic

'Introduction to Classical Mechanics', Arya (Prentice Hall 1990)

'Mechanics', 3rd edition, Landau & Lifshitz (Pergamon 1989)

'Classical Dynamics of Particles and Systems', 5th edition, Thornton & Marion (Thomson Learning 2004)

'Deterministic Chaos', 2nd edition, Schuster (VCH 1988)

Advanced

'Foundations of Mechanics', 2nd edition, Abraham & Marsden (Benjamin/Cummings 1978)

'Mathematical Methods of Classical Mechanics', Arnold, (Springer 1978)

'Universality in Chaos', 2nd edition, Cvitanović (IOP Publishing 1989)

'Order within Chaos', Bergé, Pomeau, & Vidal (Herman 1984)

'Chaos in Classical and Quantum Mechanics', Gutzwiller (Springer 1990)

Mathematical and computational

'Mathematical Methods for Physicists', 7th edition, Arfken, Weber, & Harris (Academic Press 2012)

'Tables of Integrals, Series, and Products', 6th edition, Gradsheyn, & Ryzhik (Academic Press 2000)

'Handbook of Mathematical Functions', Abramowitz & Stegun (Dover 1972)

'A first course in computational physics', 2nd edition, DeVries & Hasbun (Jones & Barlett 2010)

'Numerical Recipes: The Art of Scientific Computing', 3rd ed., W. H. Press *et al.* (Cambridge UP 2007)

Topics: Basic Principles of Newtonian Mechanics

Lagrange's Equations

Central Force Problems, Scattering

Hamilton's Equations of Motion

Canonical Transformations

Hamilton-Jakobi Theory

Special Relativity

Dynamical Systems and Chaos

Homework: You are encouraged to discuss *strategies* for solving homework assignments in small groups. However, I require that you write and return to me at the assigned due dates your own detailed solutions. You will receive no credit for solutions that you have copied. In order to obtain full credit, I also request that you present correct answers in a professional, well organized, and readable manner, including all relevant derivations and references. In addition to the "for credit" homework assignments, I will frequently ask you to complete simple calculations that we don't have time for in class. It is important that you carefully "fill in" these gaps when reviewing your lecture notes. This is done most efficiently before the subsequent lecture.

Credit :	Exam 1	200 points	Grades:	A	> 849	points
	Exam 2	200 points		B	700-849	points
	Final Exam	300 points		C	550 - 699	points
	Homework/Project	300 points		D	450 - 549	points
				F	< 450	points

University policy requires that the following statements appear on this syllabus:

1. Academic Honesty

Kansas State University has an Honor System based on personal integrity, which is presumed to be sufficient assurance that, in academic matters, one's work is performed honestly and without unauthorized assistance. Undergraduate and graduate students, by registration, acknowledge the jurisdiction of the Honor System. The policies and procedures of the Honor System apply to all full and part-time students enrolled in undergraduate and graduate courses. The honor system website can be reached via the following URL: www.k-state.edu/honor. A component vital to the Honor System is the inclusion of the Honor Pledge which applies to all assignments, examinations, or other course work undertaken by students. The Honor Pledge is implied, whether or not it is stated: "On my honor, as a student, I have neither given nor received unauthorized aid on this academic work." A grade of XF can result from a breach of academic honesty. The F indicates failure in the course; the X indicates the reason is an Honor Pledge violation.

2. Statement Regarding Students with Disabilities

Students with disabilities who need classroom accommodations, access to technology, or information about emergency building/campus evacuation processes should contact the Student Access Center and/or their instructor. Services are available to students with a wide range of disabilities including, but not limited to, physical disabilities, medical conditions, learning disabilities, attention deficit disorder, depression, and anxiety. Contact the [Student Access Center](#) at accesscenter@k-state.edu, 785-532-6441.

3. Expectations for Classroom Conduct

All student activities in the University, including this course, are governed by the [Student Judicial Conduct Code](#) as outlined in the Student Governing Association [By Laws](#), Article V, Section 3, number 2. Students who engage in behavior that disrupts the learning environment may be asked to leave the class.