

**PHY 711 Classical Mechanics and
Mathematical Methods**

Currently: 12-12:50 AM MWF Olin 103

Plan for Lecture 1:

- 1. Welcome & overview**
- 2. Class structure & announcements**
- 3. Introduction to algebraic manipulation software – Maple and Mathematica**

➤ **Start reading Chap. 1 for next time**

8/31/2016 PHY 711 Fall 2016 -- Lecture 1 1

Comment about Physics Colloquia

<http://physics.wfu.edu>

8/31/2016 PHY 711 Fall 2016 -- Lecture 1 2

WFU Physics Colloquium

TITLE: "Welcome to the WFU Physics Department"

TIME: Wednesday Aug. 31, 2016 at **3:45 PM***

PLACE: George P. Williams, Jr. Lecture Hall, (Olin 101)

*** Note: early starting time.**

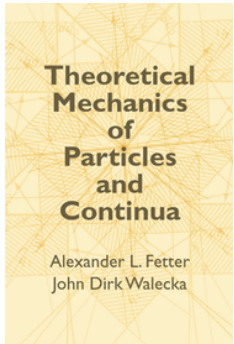
Refreshments will be served at **3:15 PM** in the lounge. All interested persons are cordially invited to attend.

PROGRAM

The purpose of this first seminar is to help new, returning, and prospective students (including both undergraduate and graduate students), faculty, and staff to become acquainted with each other and with the Physics Department. After refreshments in the lounge in the lobby of Olin Physical Laboratory (starting at 3:15), we will meet in the George P. Williams, Jr. Lecture Hall (Olin 101) at 3:45 PM for some announcements followed by presentations by some undergraduate students, highlighting their summer research experiences.

8/31/2016 PHY 711 Fall 2016 -- Lecture 1 3

Textbook:



Theoretical Mechanics of Particles and Continua
Alexander L. Fetter
John Dirk Walecka

SIGNIFICANT NAMES IN MECHANICS AND MATHEMATICAL PHYSICS'

Isaac Newton (1642-1727)
Daniel Bernoulli (1700-1782)
Leonhard Euler (1707-1783)
Jean Le Rond d'Alembert (1717-1783)
Joseph Louis Lagrange (1736-1813)
Pierre Simon de Laplace (1749-1827)
Adrien Marie Legendre (1752-1833)
Jean Baptiste Joseph Fourier (1768-1830)
Karl Friedrich Gauss (1777-1855)
Siméon-Denis Poisson (1781-1840)
Friedrich Wilhelm Bessel (1784-1846)
Augustin-Louis Cauchy (1789-1857)
George Green (1793-1841)
Carl Gustav Jacob Jacobi (1804-1851)
William Rowan Hamilton (1805-1865)
Joseph Liouville (1809-1882)
George Gabriel Stokes (1819-1903)
Hermann Ludwig Ferdinand Helmholtz (1821-1894)
Gustav Robert Kirchhoff (1824-1887)
William Thomson (Lord Kelvin) (1824-1907)
Georg Friedrich Bernhard Riemann (1826-1866)
John William Strutt (Lord Rayleigh) (1842-1919)

8/31/2016 PHY 711 Fall 2016 -- Lecture 1 4

Topics

<p>Classical Mechanics</p> <ul style="list-style-type: none"> • Scattering theory • Accelerated reference frames • Calculus of variation • Lagrangian formalism • Hamiltonian formalism • Oscillations about equilibrium • Wave equations • Rigid rotation; moments of inertia • Physics of fluids • Sound waves in fluids and solids • Surface waves • Heat conduction • Viscous fluids • Elastic continua 	<p>Math Methods</p> <ul style="list-style-type: none"> • Use of Maple and/or Mathematica • Solutions methods for differential equations • Green's function methods • Special functions • Matrix properties; eigenvalues and eigenvectors • Fourier transforms • Laplace transforms • Contour integration
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8/31/2016 PHY 711 Fall 2016 -- Lecture 1 5

Course webpage: <http://www.wfu.edu/~natalie/f16phy711>

PHY 711 Classical Mechanics and Mathematical Methods

MWF 12 AM-12:50 PM | OPL 103 | <http://www.wfu.edu/~natalie/f16phy711/>

Instructor: [Natalie Holzwarth](#) Phone:758-5510 Office:300 OPL e-mail:natalie@wfu.edu

- [General information](#)
- [Syllabus and homework assignments](#)
- [Lecture Notes](#)

Last modified: Monday, 29-Aug-2016 17:47:10 EDT

8/31/2016 PHY 711 Fall 2016 -- Lecture 1 6

Possible time shift for class on MWF

Time	Course
9:00 – 9:50 AM	
10:00 – 10:50 AM	PHY 741 (Quantum Mechanics)
11:00 – 11:50 AM	
12:00 – 12:50 AM	PHY 711 (currently)


Current time conflicts with PHY 663 – possibly shift to 9 AM or 11 AM? **Olin 107**

Note: We will have class on Friday at the new time, but **Monday's class is cancelled**. (Additional lecture will be scheduled for a later time.)

8/31/2016 PHY 711 Fall 2016 – Lecture 1 10

Comment on software useful for this course

<https://software.wfu.edu/audience/students/>



Installation straightforward; takes a while ..
Please contact me or yjpcw@wfu.edu if you have trouble.

8/31/2016 PHY 711 Fall 2016 – Lecture 1 11

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PHY 711 - Assignment #1

PDF VERSION 08/31/2016

1. Use maple or mathematica to plot the functions

$$f(x) = e^{-x^2} \quad \text{and} \quad h(x) = \int_0^x f(t) dt.$$

and to numerically evaluate $f(5)$ and $h(5)$.

8/31/2016 PHY 711 Fall 2016 – Lecture 1 12

Brief assessment exercise.

Brief (re)view of Maple.

8/31/2016

PHY 711 Fall 2016 -- Lecture 1

13
