

# Ph 1 a: Classical Mechanics

HOW PHILOSOPHICALLY EXCITING THE QUESTIONS ARE TO A NOVICE STUDENT

↑  
VERY

SPECIAL RELATIVITY

QUANTUM MECHANICS

MAGNETS

GENERAL RELATIVITY

BASIC PHYSICS

FLUID DYNAMICS

↑  
MANY

↑  
HOW MANY YEARS OF MATH ARE NEEDED TO UNDERSTAND THE ANSWERS

↑↑ DANGER ZONE ↑↑

HOW PHILOSOPHICALLY EXCITING THE QUESTIONS ARE TO A NOVICE STUDENT

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BASIC PHYSICS

this class

FLUID DYNAMICS

MANY

HOW MANY YEARS OF MATH ARE NEEDED TO UNDERSTAND THE ANSWERS

↑↑ DANGER ZONE ↑↑

(<http://www.its.caltech.edu/~ph1a/>)

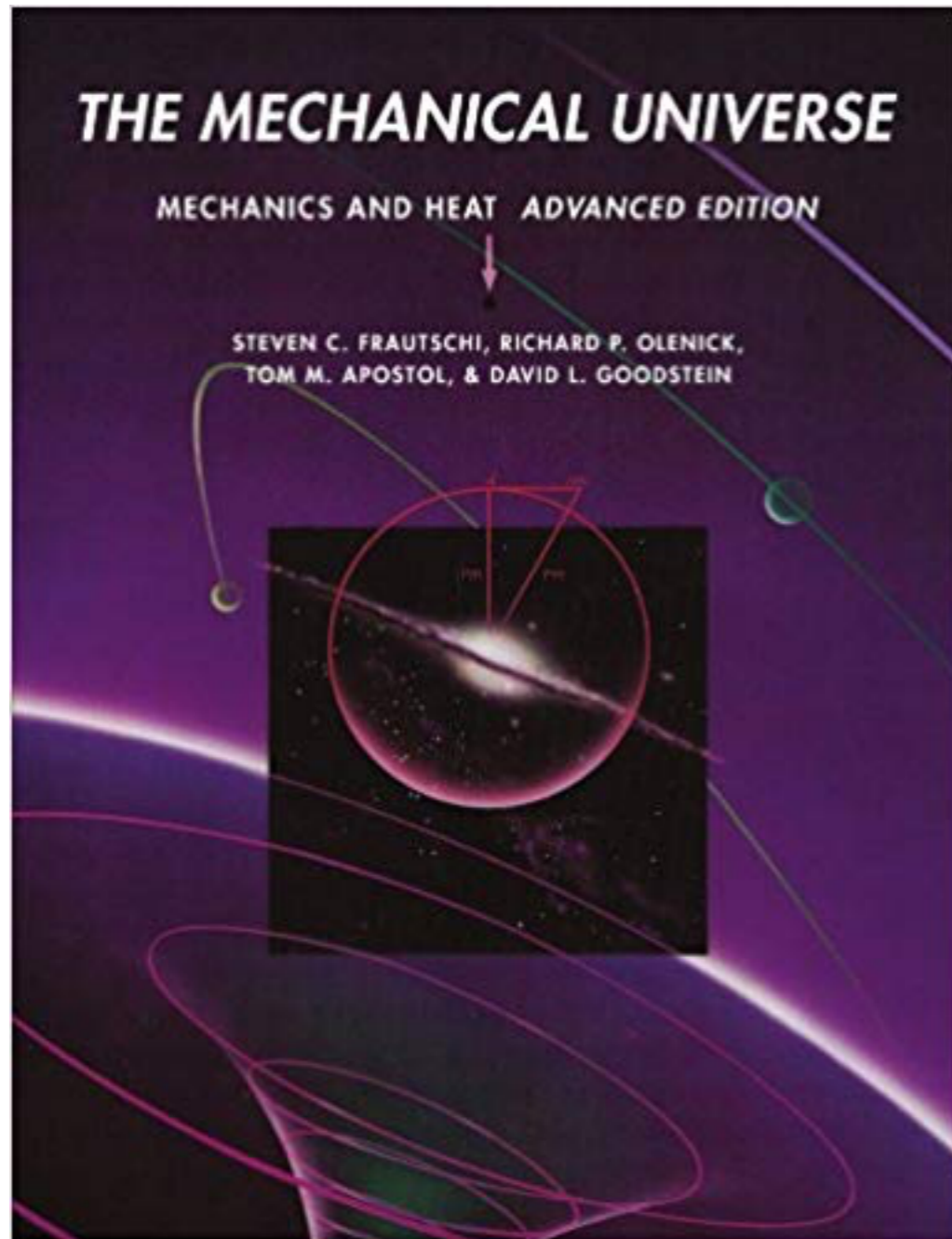


syllabus, calendar, etc. are all here

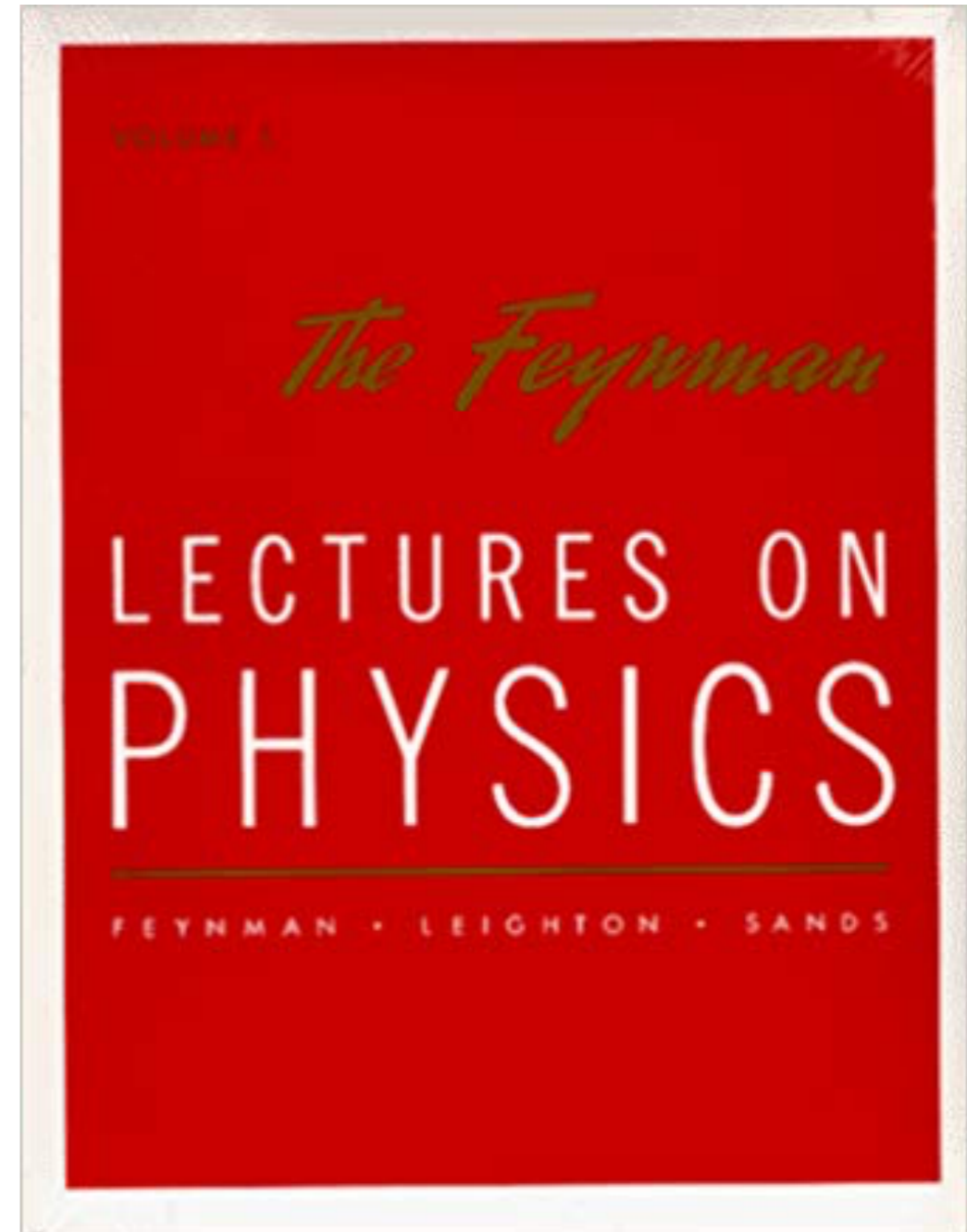
# topics

- kinematics
- Newton's laws
- gravity
- energy
- momentum
- rotational dynamics
- oscillatory motion
- Kepler's laws
- fluid mechanics

(required)



(optional)



# calendar

October 2019				
Monday	Tuesday	Wednesday	Thursday	Friday
<p><b>No Recitation!</b></p> <p><b>Required Reading:</b> Frautschi et al. Chapters 1, 3, 5</p>	<p><b>1</b></p> <p><b>Suggested Reading:</b> Feynman Vol. I Chapters 1, 2, 8, 11</p>	<p><b>2</b></p> <p><b>Lecture 1</b> Introduction</p> <p><b>Homework 1:</b> 3.13, 4.9, 5.4, <a href="#">QP1</a>, <a href="#">QP9</a></p>	<p><b>3</b></p> <p><b>Required Reading:</b> Frautschi et al. Chapters 2, 4</p>	<p><b>4</b></p> <p><b>Lecture 2</b> Kinematics and Reference Frames</p>
<p><b>7</b></p> <p><b>Required Reading:</b> Frautschi et al. Chapter 6</p>	<p><b>8</b></p> <p><b>Suggested Reading:</b> Feynman Vol. I Chapters 9, 12</p>	<p><b>9</b></p> <p><b>Lecture 3</b> Newton's Laws</p> <p><b>Homework 2:</b> 6.24, 8.18, <a href="#">QP4</a>, <a href="#">QP11</a>, <a href="#">QP20</a></p> <p><b>Homework 1 Due</b> <b>Quiz 1 handed out</b></p>	<p><b>10</b></p> <p><b>Required Reading:</b> Frautschi et al. Chapter 8 except Section 8.6</p>	<p><b>11</b></p> <p><b>Lecture 4</b> Forces of Nature</p>
<p><b>14</b></p> <p><b>Required Reading:</b> Frautschi et al. Chapter 7 and Section 8.6</p> <p><b>QUIZ 1 DUE</b></p>	<p><b>15</b></p> <p><b>Suggested Reading:</b> Feynman Vol. I Chapter 7</p>	<p><b>16</b></p> <p><b>Lecture 5</b> Gravity and Circular Motion</p> <p><b>Homework 3:</b> 7.17, <a href="#">QP21</a>, <a href="#">QP28</a>, <a href="#">QP29</a></p> <p><b>Homework 2 Due</b></p>	<p><b>17</b></p> <p><b>Required Reading:</b> Frautschi et al. Chapter 9</p>	<p><b>18</b></p> <p><b>Lecture 6</b> Accelerating Reference Frames</p>
<p><b>21</b></p> <p><b>Required Reading:</b> Frautschi et al. Chapter 10</p>	<p><b>22</b></p> <p><b>Suggested Reading:</b> Feynman Vol. I Chapters 4, 13, 14, 10</p>	<p><b>23</b></p> <p><b>Lecture 7</b> Energy</p> <p><b>Homework 4:</b> 10.21, 10.25, <a href="#">QP30</a>, <a href="#">QP34</a></p> <p><b>Homework 3 Due</b> <b>Quiz 2 handed out</b></p>	<p><b>24</b></p> <p><b>Required Reading:</b> Frautschi et al. Chapter 11</p>	<p><b>25</b></p> <p><b>Lecture 8</b> Momentum</p>
<p><b>28</b></p> <p><b>Required Reading:</b> Frautschi et al. Chapter 13</p> <p><b>QUIZ 2 DUE</b></p>	<p><b>29</b></p> <p><b>Suggested Reading:</b> Feynman Vol. I Chapters 18, 19, 20</p>	<p><b>30</b></p> <p><b>Lecture 9</b> Angular Momentum</p> <p><b>Homework 5:</b> 13.10, <a href="#">FP8</a>, <a href="#">QP15</a>, <a href="#">QP33</a></p> <p><b>Homework 4 Due</b></p>	<p><b>31</b></p> <p><b>Required Reading:</b> Frautschi et al. Sections 14.1 – 14.7</p>	

# lecture times

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# section times

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# sections

ALL RECITATION SECTIONS MEET ON MONDAYS AND THURSDAYS					
Sec	Time	Location	Instructor	Office	Ext
1	1-2 pm	B111 DWN	Steven Frautschi scf@theory.caltech.edu	467 Lauritsen	6689
2	3-4 pm	B111 DWN	Steven Frautschi scf@theory.caltech.edu	467 Lauritsen	6689
3	1-2 pm	155 ARMS	Rajashik Tarafder rtarafder@caltech.edu	B146 W. Bridge	4244
4	3-4 pm	107 DWN	Rana Adhikari rana@caltech.edu	254 W. Bridge	8709
5	1-2 pm	269 LAU	Hien T. Nguyen hien.t.nguyen@jpl.nasa.gov	366 Cahill	4318
6 <sup>+</sup>	3-4 pm	102 STL	Nabha Shah nnshah@caltech.edu	414 Lauritsen	6653
7	1-2 pm	102 STL	Rana Adhikari rana@caltech.edu	254 W. Bridge	8709
8 <sup>+</sup>	3-4 pm	269 LAU	Minyoung You myou@caltech.edu	445 Lauritsen	2630
9	1-2 pm	142 KCK	Sergi R. Hildebrandt srh@caltech.edu	364 Cahill	5974
10	3-4 pm	119 DWN	Harvey B. Newman newman@caltech.edu	247 Lauritsen	6656
Head TA			Rajashik Tarafder rtarafder@caltech.edu		

more advanced topics →

← “flipped”

See the syllabus for how to change sections.

# homework due dates

October 2019				
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# homework

<u>QP1</u>	<u>QP2</u>	<u>QP3</u>	<u>QP4</u>
<u>QP5</u>	<u>QP6</u>	<u>QP7</u>	<u>QP8</u>
<u>QP9</u>	<u>QP10</u>	<u>QP11</u>	<u>QP12</u>
<u>QP13</u>	<u>QP14</u>	<u>QP15</u>	<u>QP16</u>
<u>QP17</u>	<u>QP18</u>	<u>QP19</u>	<u>QP20</u>
<u>QP21</u>	<u>QP22</u>	<u>QP23</u>	<u>QP24</u>
<u>QP25</u>	<u>QP26</u>	<u>QP27</u>	<u>QP28</u>
<u>QP29</u>	<u>QP30</u>	<u>QP31</u>	<u>QP32</u>
<u>QP33</u>	<u>QP34</u>	<u>QP35</u>	<u>QP36</u>
<u>QP37</u>	<u>QP38</u>	<u>QP39</u>	<u>QP40</u>
<u>QP41</u>	<u>QP42</u>	<u>QP43</u>	<u>QP44</u>
<u>QP45</u>	<u>QP46</u>	<u>QP47</u>	<u>QP48</u>
<u>QP49</u>	<u>QP50</u>	<u>QP51</u>	<u>QP52</u>
<u>QP53</u>			
<u>FP1</u>	<u>FP2</u>	<u>FP3</u>	<u>FP4</u>
<u>FP5</u>	<u>FP6</u>	<u>FP7</u>	<u>FP8</u>
<u>FP9</u>	<u>FP10</u>	<u>FP11</u>	<u>FP12</u>
<u>FP13</u>	<u>FP14</u>	<u>FP15</u>	<u>FP16</u>
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See the syllabus for late policy and logistics.

# quiz due dates

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# grades

homework (20%)

+

quizzes (40%)

+

final exam (40%)

(passing grade  $> 50\%$ )

# ombuds

# FERPA waiver

House	Name	E-mail
Avery		
Blacker		
Dabney		
Fleming		
Lloyd		
Page		
Ricketts		
Ruddock		

### Math and Physics Classwork Return Form 2017-2018 Freshmen and Sophomores

Graded work will be returned to you in your recitation section or in class (depending on the class). If you do not collect your work at that time, you have the option to pick up your work in a homework pick up box. The location of these pick up boxes differs. In math, they are beside the homework submission boxes. In Physics 1 and 2, they are on the 1<sup>st</sup> floor of Bridge Annex. For other physics course, please consult your TA or instructor.

Due to FERPA regulations, we cannot place graded work in a public location without your permission. Please fill out the form below and submit it to Meagan Heirwegh (via email to [heirwegm@caltech.edu](mailto:heirwegm@caltech.edu) or in person to 101 Bldg 15) or to the drop box marked FERPA forms in the hallway between 113 and 119 Downs. If you do not fill out this form, the default assumption is that you have not given permission and your work will not be publicly available.

Please note that this waiver will cover all physics and math courses you may take during the 2017-2018 school year at Caltech, which means that you should only have to fill out one of these this year. You may revoke your consent for some or all of these courses at any time by contacting Meagan Heirwegh.

Check one:

- YES, I GIVE PERMISSION to have my graded physics and math work placed in a public location so I can collect it there.
- NO, I DO NOT GIVE PERMISSION to have my graded physics and math work placed in a public location.
- I GIVE PERMISSION to have my work placed in a public location for collection for the following classes: \_\_\_\_\_  
I DO NOT GIVE PERMISSION to have my work placed in a public location for the following classes: \_\_\_\_\_

Name (print LEGIBLY): \_\_\_\_\_

Signature: \_\_\_\_\_

UID: \_\_\_\_\_ Date: \_\_\_\_\_

Caltech Email Address: \_\_\_\_\_

Expect an email from the head TA soliciting ombudspersons.

[Download the FERPA waiver](#), sign, then email to [pma.caltech@gmail.com](mailto:pma.caltech@gmail.com).

# Lecture 1: Dimensional Analysis



# Trinity Test

