TENTATIVE COURSE SCHEDULE

Please Note: Note "( )" are equations

| Day | Reading for HW | Problems Due (Worked in Class) |
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| **Week 1** | | |
| Monday 1:30PM | Morning: Lecture 1(Part I), Read Chapter 1 on the fly—per class discussion— while doing problems. Verify all the equations before we regroup in the afternoon. Do the same for DiCenzo's handout. Afternoon: Lecture 1(Part II), work on remainder of HW. Read Ch2, pp. 25-39 Download "MathToKnow" and "MathChecklist" handout and Equation Sheet. Keep the "MathChecklist" near your Equation Sheet when you do homework. We'll be reading MathToKnow as schedule dictates. | Due first afternoon (1.12), (1.33), (1.25), (1.27). Prof. DiCenzo's Handout: 2,4,6c,7,8,11a,12a,c,14, 15,17 |
| Tuesday | Lecture 2 (Infinite square well (ISW) /time-independent solutions; Do pb#2.5 together) Read Ch2, pp. 39-48, and MathOverview Sections 1 and 2. | DiCenzo's Handout: 19,21a,23a,b,24a,b,25c,d, 26,27,28,Verify all of Section VI, and Section VIII. 33,34(Hint: Rewrite equations with A and B switched around) **1**.1,3,5, 7(Hint: Do integration by parts like we did in Lecture 1). (2.30), (2.31) |
| Wednesday | Lecture 3 (Harmonic Oscillator, Pt 1) Reading tonight: Work through of "Math Overview" up to Hydrogen atom section. Try all Examples. | **1.**14,18, Ex. 2.2, **2**.2(Test that V(x)=0 and E<0 results in a non-normalizable wave function),2.4 |
| Thursday | Lecture 4 (Harmonic Oscillator, Pt 2),Math to consider/"MathToKnow Overview" Lecture Phil, don't forget to talk about why $H\psi = E\psi$ is an eigenvalue problem if not already). Free style lecture, go over handout(s). Read pp. 96-102, pp. 119 | **2.**6(We will have done pb#2.5 in class), 2.7 (Hint: Of the odds/evens, can contribute to the story; also use "Cute Tricks in MathChecklist"), 2.9, (2.33), (2.37), (2.58) Find the Hermitian conjugates (see lecture notes) of $\frac{d^2}{dx^2}$, $i\frac{d}{dx}$, $x$. Which, if any of these three operators is Hermitian? Show that $a_-^\dagger = a_+$, **2**.10,3.4,3.5 |

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| Friday | Lecture 5(Cold presentation of Uncertainty Principle and Hermitian Operator Properties ) Read Chapter 3 up to pp. 108 | 3.26, Examples and problems of MathToKnow (Avoid H-atom pbs./examples). Will try some together in class. |

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| **Week 2** | | |
| Monday | Lecture 6 (Lecture on Commutation+Catch up?) | **2**.11, 12, 17, and 13. (2.68), (2.60), (2.69). Verify that (2.86) agrees with (2.68) for n=0,1,2,3. Does Figure 2.7 agree with our intuition about when the wiggles should be extra wiggly? Hint: See Section 1 of MathToKnow. Ex. 3.1 and 3.2, pbs.#3.7a,3.28,3.14, 3.15 |
| Tuesday | Lecture 7 (Catch up?)<br>Read Chapter 4 up to pp. 138. | 2.39,2.37,2.40 (these 3 problems review HO and ISW) 2.18 (Notice $J \neq J(x)$), 2.20, 2.21(Take $< p^2 >$ as a given and do integral if time permits) |
| Wednesday | Lecture 8 (Lecture 8 Angular Eqn.)<br>Read Chapter 4, pp. 138-156 (skip the power series biz) Finish MathToKnow on H-atom | 4.1, 4.2, 4.4, 4.7, (4.14), (4.16), (4.17), Show, geometrically, why $d^3r = dxdydz = r^2 dr d\Omega = r^2 \sin(\theta) d\theta d\phi$ |
| Thursday | Lecture 9 Finish H-atom biz, do Pb. 4.18 together. | Do H-atom Examples and problems—if any, yet--of MathToKnow. |
| Friday | Review for **Midterm** | 4.13,4.15,4.16, 4.18(lecture?),4.19 |
| **Week 3 (Tentative)** | | |
| Monday | Morning: Midterm<br>Read pp. 157-162 | |
| Tuesday | Lecture 10 Angular Momentum<br>Read pp. 162-164 | (4.99),(4.100),(4.102), (4.106), (4.107), 4.21, 4.22(part d) takes some thought!) |
| Wednesday | Lecture 11 Eigenfunctions<br>Read pp. 165-75 | Get (4.109) from (4.104), (4.113) from (4.112), (4.116) from (4.112) |
| Thursday | Lecture 12: Spin<br>Read pp. 176-180 | (4.124), (4.125),(4.126)—justify them visually using geometry skills; check them for specific angles. (4.127),(4.128), (4.129) 4.25(Do part c) if you have time; save it for last. It requires the reduction formula integral, kinda fun!),4.26,4.27a,b |
| Friday | Lecture 13: Addition of $L$ /Clebsch-Gordon [Read pp.55-59 (Free particle) **Ch3** pp.108-113]? | 4.28, 4.30,4.31,4.32, 4.34(Play! Have fun trying!) , Ex.4.3, Ex. 4.4 |
| **Week 4** | | |
| Monday | Lecture 14: Visualizing Traveling Wave/Free Particle | 4.35; 4.37, 4.38,4.39,4.40 [Examples 3.5-3.7]? |
| Tuesday | Review | |
| Wednesday | **Final** | |