

Spring Semester 2018
Introduction to Quantum Mechanics I
 Instructor: Johannes Zwanikken
 Olney Science Center 136b



Course Schedule

	TUESDAY	THURSDAY
JAN	23 A Really Short Introduction to Quantum Mechanics Quanta, uncertainty, particle waves Reading: Sections 1.1 and 1.2 Summarize sections 1.1 and 1.2	25 Evolution of probability: The Schrödinger equation Reading: Sections 1.1 - 1.4 Problems: 1.1 1.3 1.4 1.5
JAN/ FEB	30 Momentum and position: Heisenberg's uncertainty principle Reading: Sections 1.5 and 1.6 Summarize sections 1.5 and 1.6	01 Separation of variables: The time-independent Schrödinger equation Reading: Section 2.1 Problems: 1.7 1.9 1.17 1.18 2.1 2.2
FEB	06 The infinite square well I Reading: Section 2.2 Summarize Section 2.1	08 The infinite square well II Reading: Section 2.2 Problems: 2.4 2.6 2.7 2.8
FEB	13 The harmonic oscillator I Reading: Section 2.3.1 Summarize section 2.3.1	15 The harmonic oscillator II Reading: Section 2.3 Problems: 2.11 2.12 2.17
FEB	20 Monday schedule	22 Free particles, barriers, and tunneling I Reading: Section 2.4 and 2.5 Summarize sections 2.4 and 2.5
FEB/ MAR	27 Free particles, barriers, and tunneling II Reading: Sections 2.4 – 2.6 Problems: 2.21 2.22 2.23 2.27 + understand what figure 2.19 means	01 Exam I
MAR	06 The formalism: Linear algebra, Hilbert Space Reading: Section 3.1 Summarize section 3.1	08 <i>mid semester</i> Observables Reading: Sections 3.1 and 3.2 Problems: 3.1 3.3 3.5 3.6

MAR	13 Spring break	15 Spring break
MAR	20 Eigenvalues and eigenfunctions Reading: Section 3.3 Summarize section 3.3	22 Statistical interpretation, the uncertainty principle Reading: Sections 3.3 - 3.5 Problems: 3.7 3.8 3.9 3.13 3.17
MAR	27 Dirac notation Reading: Section 3.6 Summarize section 3.6	29 Quantum mechanics in 3 dimensions Reading: Section 4.1 (do not become confused by all the functions) Problems: 4.1 4.2 4.8
APR	03 The hydrogen atom I Reading: Section 4.2.1 Summarize section 4.2.1 (in words) plus equations 4.70 and 4.72	05 The hydrogen atom II Reading: Section 4.2 Problems: 4.10 4.13 4.16
APR	10 Exam II	12 Angular momentum Reading: Section 4.3 Problems: 4.18 4.19 4.24
APR	17 Spin Reading: Section 4.4 Summarize section 4.4.1	19 Stern-Gerlach Reading: Section 4.4 Problems: 4.26 4.28 4.32 4.34 4.35
APR	24 Many-particle systems: Bosons and fermions Reading: Section 5.1 Summarize section 5.1	26 Atoms Reading: Sections 5.1 and 5.2 Problems: 5.9 5.12 5.14
MAY	01 Solids Reading: Section 5.3 Summarize section 5.3	03
MAY	08 Final exam week	10 Final exam week

Part I	Introduction: The Schrödinger equation and fundamental quantum systems
Part II	The formalism
Part III	Quantum mechanics of atoms and solids
Exam I	Part I
Exam II	Part II + the hydrogen atom
Final exam	All material covered in the course