

Course Changes

Texas A&M University
Departmental Request for a Change in Course
Undergraduate ♦ Graduate ♦ Professional

RECEIVED

JAN 16 2013 *AS*

GRADUATE STUDIES

• Submit original form and attachments •

1. Request submitted by (Department or Program Name): Physics and Astronomy
2. Course prefix, number and complete title of course: PHYS 606 Quantum Mechanics

Attach a brief supporting statement for changes made to items 3a thru 3d, and 6 below.

3. Change requested
- a. Prerequisite(s): From: _____ To: _____
- b. Withdrawal (reason): _____
- c. Cross-list with: _____
- Cross-listed courses require the signature of both department heads.**
- d. Change in course title and description. Enter complete current course title and current course description in item 5; enter proposed course title and proposed course description in item 6. Complete item 7 for change in title.
- e. Change in course number, contact hours (lab & lecture), and semester credit hours. Complete item 7. **Attach a course syllabus.**
4. For informational purposes only, please indicate course number if this course will be stacked: _____
5. Complete current course title and current catalog course description: _____

6. Complete proposed course title and proposed catalog course description (not to exceed 50 words): _____

7. a. As currently in course inventory:

Prefix		Course #		Title (excluding punctuation)																										
P	H	Y	S	6	0	6	Q	U	A	N	T	U	M	M	E	C	H	A	N	I	C	S								
Lect.	Lab	SCH	CIP and Fund Code								Admin. Unit			FICE Code				Level												
0	4	0	0	0	4	4	0	0	8	0	1	0	0	0	2	2	3	0	0	0	0	3	6	3	2					

- b. Change to:

Prefix		Course #		Title (excluding punctuation)																											
P	H	Y	S	6	0	6	Q	U	A	N	T	U	M	M	E	C	H	A	N	I	C	S									
Lect.	Lab	SCH	CIP and Fund Code								Admin. Unit			Acad. Year				FICE Code	Level												
0	3	0	0	0	3	4	0	0	8	0	1	0	0	0	2	2	3	0	0	1	3	-	1	4	0	0	3	6	3	2	

Approval recommended by:

George R. Welch 11.21.2012
 Department Head or Program Chair (Type Name & Sign) Date

George R. Welch
 Department Head or Program Chair (Type Name & Sign) Date
 (if cross-listed course)

[Signature] 12-10-12
 Chair, College Review Committee Date

[Signature] 1-9-13
 Dean of College Date

[Signature] 2-7-13
 Chair, GC or UCC Date

Submitted to Coordinating Board by:

Associate Director, Curricular Services

Date

Effective Date

PHYS 606: Quantum Mechanics I
spring 2013

Instructor

Dr. Aleksei Zheltikov
zheltikov@physics.tamu.edu
MPHY 542
979.458.7934

Course meetings

TR 12:45-2:00pm in MPHY 107

Final exam

Wednesday, May 8, 2013; 8:00-10:00am

Course (catalog) description

Schrödinger wave equation, bound states of simple systems, collision theory, representation and expansion theory, matrix formulation, perturbation theory.

Prerequisites

MATH 601, PHYS 412 or equivalents

Texts

required

Quantum Mechanics, 3rd ed.; Dec 1997
by Eugen Merzbacher
publisher: Wiley
ISBN-10: 0471887021
ISBN-13: 978-0471887027

recommended

Quantum Mechanics Non-Relativistic Theory, 3rd ed., vol. 3; 2000
by L. D. Landau and E. M. Lifshitz
publisher: Butterworth-Heinemann
ISBN-10: 0750635398
ISBN-13: 978-0750635394

recommended

Modern Quantum Mechanics, 2nd ed.; Jul 2010
by J. J. Sakurai and Jim J. Napolitano
publisher: Addison Wesley
ISBN-10: 0805382917
ISBN-13: 978-0805382914

Grading

50% homework assignments
50% two (2) exams
A = 90% or higher
B = 80%-90%
C = 60%-80%

See <http://student-rules.tamu.edu/rule07> for information on University-excused absences.

Topics

Basic principles of quantum mechanics
Wave packets
Wave mechanics

- Schrödinger equation, both time dependent and time independent
- Operators, probabilities, and expectation values for physical observables
- Eigenvalues and eigenfunctions of operators
- Commutators
- Uncertainty relations
- Transformations between bases
- Matrix mechanics
- Exactly solvable 1-D problems
 - Sectionally-constant potentials
 - Harmonic oscillator, in both wave and matrix mechanics
- Approximation methods in quantum mechanics
 - Variational method
 - Time-independent perturbation theory
- Angular momentum in quantum mechanics
 - Basic principles
 - Allowed eigenvalues and eigenfunctions
 - Spin $\frac{1}{2}$
- Spherically symmetric potentials
 - Free particle
 - Finite square well
 - Hydrogen atom

ADA statement

The Americans with Disabilities Act (ADA) is a federal anti-discrimination statute that provides comprehensive civil rights protection for persons with disabilities. Among other things, this legislation requires that all students with disabilities be guaranteed a learning environment that provides for reasonable accommodation of their disabilities. If you believe you have a disability requiring an accommodation, please contact Disability Services, in Cain Hall, Room B118, or call 979-845-1637. For additional information visit <http://disability.tamu.edu>.

academic integrity

The Aggie Honor Code is *"An Aggie does not lie, cheat, or steal or tolerate those who do."* For more information, refer to the Honor Council Rules and Procedures on the web at <http://www.tamu.edu/aggiehonor>.

the 1990s, the number of people in the world who are under 15 years of age is expected to increase from 1.1 billion to 1.5 billion (United Nations 1998).

There are a number of reasons why the number of children in the world is increasing. One of the main reasons is the decline in the death rate of children under 5 years of age. In 1990, the death rate of children under 5 years of age was 100 per 1,000 live births. By 2000, this rate is expected to fall to 60 per 1,000 live births (United Nations 1998).

Another reason for the increase in the number of children in the world is the increase in the life expectancy of people. In 1990, the life expectancy of people was 72 years. By 2000, this is expected to rise to 77 years (United Nations 1998). This means that people are living longer, and therefore there are more children in the world.

The increase in the number of children in the world is a cause for concern. It is expected that by 2000, there will be 1.5 billion children in the world. This is a huge number of children, and it is likely to place a heavy burden on the world's resources. It is important that we take steps to ensure that all children have access to education, health care, and other basic needs.

One of the ways in which we can help to reduce the number of children in the world is by promoting family planning. This involves providing people with information and services that allow them to control the size of their families. This can help to reduce the number of children in the world, and it can also help to improve the lives of the children who are born.

Another way in which we can help to reduce the number of children in the world is by improving the health care of women and children. This includes providing access to prenatal care, safe childbirth, and postnatal care. It also includes providing access to immunizations and other health services. Improving the health care of women and children can help to reduce the death rate of children under 5 years of age, and it can also help to improve the lives of the children who are born.

Finally, we can help to reduce the number of children in the world by promoting education. This includes providing access to primary and secondary education for all children. Education can help to improve the lives of children, and it can also help to reduce the number of children in the world. Educated women are more likely to use family planning, and they are more likely to have fewer children.

In conclusion, the number of children in the world is increasing, and this is a cause for concern. It is important that we take steps to ensure that all children have access to education, health care, and other basic needs. We can help to reduce the number of children in the world by promoting family planning, improving the health care of women and children, and promoting education.

References

- United Nations (1998) *World Population Prospects: The 1998 Revision*. New York: United Nations.
- World Bank (1998) *World Development Report 1998: Attaining Universal Primary Education*. Washington, DC: World Bank.
- World Health Organization (1998) *World Health Statistics Quarterly*, 51(1): 1-12.
- World Health Organization (1999) *World Health Statistics Quarterly*, 52(1): 1-12.
- World Health Organization (2000) *World Health Statistics Quarterly*, 53(1): 1-12.
- World Health Organization (2001) *World Health Statistics Quarterly*, 54(1): 1-12.
- World Health Organization (2002) *World Health Statistics Quarterly*, 55(1): 1-12.
- World Health Organization (2003) *World Health Statistics Quarterly*, 56(1): 1-12.
- World Health Organization (2004) *World Health Statistics Quarterly*, 57(1): 1-12.
- World Health Organization (2005) *World Health Statistics Quarterly*, 58(1): 1-12.
- World Health Organization (2006) *World Health Statistics Quarterly*, 59(1): 1-12.

Texas A&M University
Departmental Request for a Change in Course
Undergraduate ♦ Graduate ♦ Professional
 • Submit original form and attachments •

RECEIVED
 JAN 16 2013 AS
GRADUATE STUDIES

1. Request submitted by (Department or Program Name): Physics and Astronomy
 2. Course prefix, number and complete title of course: PHYS 607 Statistical Mechanics

3. Change requested Attach a brief supporting statement for changes made to items 3a thru 3d, and 6 below.

a. Prerequisite(s): From: _____ To: _____
 b. Withdrawal (reason): _____
 c. Cross-list with: _____

Cross-listed courses require the signature of both department heads.

d. Change in course title and description. Enter complete current course title and current course description in item 5; enter proposed course title and proposed course description in item 6. Complete item 7 for change in title.
 e. Change in course number, contact hours (lab & lecture), and semester credit hours. Complete item 7. **Attach a course syllabus.**

4. For informational purposes only, please indicate course number if this course will be stacked: _____

5. Complete current course title and current catalog course description: _____

6. Complete proposed course title and proposed catalog course description (not to exceed 50 words): _____

7. a. As currently in course inventory:

Prefix		Course #		Title (excluding punctuation)												Lect.		Lab		SCH				CIP and Fund Code				Admin. Unit				FICE Code				Level																		
P	H	Y	S	6	0	7	S	T	A	S	T	I	C	A	L	M	E	C	H	A	N	I	C	S			0	4	0	0	0	4	4	0	0	8	0	1	0	0	0	2	2	3	0	0	0	0	3	6	3	2		

b. Change to:

Prefix		Course #		Title (excluding punctuation)												Lect.		Lab		SCH				CIP and Fund Code				Admin. Unit				Acad. Year				FICE Code				Level																			
P	H	Y	S	6	0	7	S	T	A	S	T	I	C	A	L	M	E	C	H	A	N	I	C	S			0	3	0	0	0	3	4	0	0	8	0	1	0	0	0	2	2	3	0	0	1	3	-	1	4	0	0	3	6	3	2		

Approval recommended by:

George R. Welch 11.21.2012
 Department Head or Program Chair (Type Name & Sign) Date

George R. Welch
 Department Head or Program Chair (Type Name & Sign) Date

Submitted to Coordinating Board by:

[Signature] 12-10-12
 Chair, College Review Committee Date

[Signature] 1-9-13
 Dean of College Date

[Signature] 2-7-13
 Chair, GC or UCS Date

Associate Director, Curricular Services _____ Date _____ Effective Date _____

PHYS 607: Statistical Mechanics
spring 2013

Instructor

Dr. Artem Abanov
abanov@physics.tamu.edu
MPHY 415
404.981.7799

Course meetings

MWF 10:20-11:10am in MPHY 107

Final exam

Tuesday, May 7, 2013; 8:00-10:00am

Course (catalog) description

Classical statistical mechanics, Maxwell-Boltzmann distribution, and equipartition theorem quantum statistical mechanics, Bose-Einstein distribution and Fermi-Dirac distribution applications such as polyatomic gases, blackbody radiation, free electron model for metals, Debye model of vibrations in solids, ideal quantum mechanical gases and Bose-Einstein condensation, and if time permits, phase transitions and nonequilibrium statistical mechanics.

Prerequisites

PHYS 408 and 412 or equivalents

Texts

required

Statistical Mechanics, 3rd ed., pt. 1, vol. 5; Jan 1980
by L. D. Landau and E. M. Lifshitz
publisher: Butterworth-Heinemann
ISBN-10: 0750633727
ISBN-13: 978-0750633727

recommended

Statistical Mechanics, May 1990
by R. Kubo, H. Ichimura, T. Usui, and N. Hashitsume
publisher: North Holland
ISBN-10: 0444871039
ISBN-13: 978-0444871039

Grading

50% weekly homework assignments
30% two (2) exams at 15% each
20% final exam

No late work is accepted without appropriate excuse. Attendance is required. Make-up exams will be provided to those with a University-excused absence. See <http://student-rules.tamu.edu/rule07> for information on University-excused absences.

Topics

Thermodynamics

First law of thermodynamics — conservation of energy

Entropy

Definition of intensive parameters, T , P , and μ , equations of state

Second law of thermodynamics — maximum work theorem

Legendre transformations and alternative formulation of thermodynamics — thermodynamic potentials

Reduction of thermodynamics derivatives — measurable physical properties

Thermodynamic inequalities and stability

Nernst's theorem

Phase transitions — discontinuities, level rule, Clausius-Clapeyron

Mixtures — Gibbs phase rule, osmotic pressure

Statistical mechanics

Microcanonical formalism

Classical statistical mechanics — phase space, distribution functions

Canonical formalism

Classical ideal gas (internal degrees of freedom, translation, vibration, rotation, electronic)

Density of states — Debye model of crystals

Mean field theory — Ising model

Grand canonical formalism

Fermi and Bose statistics

Ideal Fermi gas

Photon gas

Ideal Bose gas — Bose Einstein condensation

Interacting classical gas

Fluctuations

Density matrices

Optional topics

Simple transport theory based on Maxwell distribution

Second order phase transitions

ADA statement

The Americans with Disabilities Act (ADA) is a federal anti-discrimination statute that provides comprehensive civil rights protection for persons with disabilities. Among other things, this legislation requires that all students with disabilities be guaranteed a learning environment that provides for reasonable accommodation of their disabilities. If you believe you have a disability requiring an accommodation, please contact Disability Services, in Cain Hall, Room B118, or call 979-845-1637. For additional information visit <http://disability.tamu.edu>.

academic integrity

The Aggie Honor Code is "*An Aggie does not lie, cheat, or steal or tolerate those who do.*" For more information, refer to the Honor Council Rules and Procedures on the web at <http://www.tamu.edu/aggiehonor>.

The first part of the document discusses the importance of maintaining accurate records of all transactions. It emphasizes that every entry should be supported by a valid receipt or invoice. This not only helps in tracking expenses but also ensures compliance with tax regulations.

In the second section, the author provides a detailed breakdown of the company's revenue streams. This includes sales from various product lines and services. The data shows a steady increase in revenue over the past year, which is attributed to strategic marketing efforts and improved operational efficiency.

The third section focuses on the company's financial health and liquidity. It highlights the strong cash flow and the ability to meet all financial obligations. The author also mentions the company's commitment to investing in research and development to stay ahead in the market.

Finally, the document concludes with a summary of the key findings and recommendations. It suggests that the company should continue to focus on innovation and customer satisfaction to drive long-term growth. The author also notes that the financial performance has been excellent and that the company is well-positioned for the future.

Texas A&M University
Departmental Request for a Change in Course
Undergraduate ♦ Graduate ♦ Professional

RECEIVED
 JAN 16 2013
 AS
GRADUATE STUDIES

• Submit original form and attachments •

1. Request submitted by (*Department or Program Name*): Physics and Astronomy
2. Course prefix, number and complete title of course: PHYS 611 Electromagnetic Theory

Attach a brief supporting statement for changes made to items 3a thru 3d, and 6 below.

3. Change requested
- a. Prerequisite(s): From: _____ To: _____
- b. Withdrawal (reason): _____
- c. Cross-list with: _____
- Cross-listed courses require the signature of both department heads.
- d. Change in course title and description. Enter complete current course title and current course description in item 5; enter proposed course title and proposed course description in item 6. Complete item 7 for change in title.
- e. Change in course number, contact hours (lab & lecture), and semester credit hours. Complete item 7. **Attach a course syllabus.**
4. For informational purposes only, please indicate course number if this course will be stacked: _____
5. Complete current course title and current catalog course description: _____

6. Complete proposed course title and proposed catalog course description (not to exceed 50 words): _____

7. a. As currently in course inventory:

Prefix		Course #		Title (excluding punctuation)																							
P	H	Y	S	6	1	E L E C T R O M A G N E T I C T H E O R Y																					
Lect.	Lab	SCH		CIP and Fund Code								Admin. Unit				FICE Code				Level							
0	4	0	0	0	4	4	0	0	8	0	1	0	0	0	2	2	3	0	0	0	0	3	6	3	2		

- b. Change to:

Prefix		Course #		Title (excluding punctuation)																											
P	H	Y	S	6	1	E L E C T R O M A G N E T I C T H E O R Y																									
Lect.	Lab	SCH		CIP and Fund Code								Admin. Unit				Acad. Year				FICE Code		Level									
0	3	0	0	0	3	4	0	0	8	0	1	0	0	0	2	2	3	0	0	1	3	-	1	4	0	0	3	6	3	2	

Approval recommended by:

<p><u>George R. Welch</u> 11.21.2012 Department Head or Program Chair (<i>Type Name & Sign</i>) Date</p> <p><u>George R. Welch</u> Department Head or Program Chair (<i>Type Name & Sign</i>) Date (if cross-listed course)</p> <p>Submitted to Coordinating Board by: _____ Associate Director, Curricular Services</p>	<p><u>[Signature]</u> 12-10-12 Chair, College Review Committee Date</p> <p><u>[Signature]</u> 1-9-13 Dean of College Date</p> <p><u>[Signature]</u> 2-7-13 Chair, GC or UCC Date</p> <p>_____ Date</p> <p>_____ Effective Date</p>
---	--

PHYS 611: Electromagnetic Theory II

fall 2012

Instructor

Dr. Christopher Pope
pope@physics.tamu.edu
MIST M520
979.845.7793

Course meetings

MWF 9:10-10:00am in MPHY 213

Final exam

Monday, December 10, 2012; 8:00-10:00am

Course (catalog) description

Continuation of PHYS 603. Propagation, reflection and refraction of electromagnetic waves; wave guides and cavities; interference and diffraction; simple radiating systems; dynamics of relativistic particles and fields; radiation by moving charges.

Prerequisites

PHYS 603

Texts

recommended

The Classical Theory of Fields, 4th ed., vol. 2 (Course of Theoretical Physics Series); Jan 1980
by L. D. Landau and E. M. Lifshitz
publisher: Butterworth-Heinemann
ISBN-10: 0750627689
ISBN-13: 978-0750627689

recommended

Classical Electrodynamics, 3rd ed., August 1998
by John David Jackson
publisher: Wiley
ISBN-10: 047130932X
ISBN-13: 978-0471309321

Grading

20% homework assignments
25% midterm 1
25% midterm 2
30% final exam

See <http://student-rules.tamu.edu/rule07> for information on University-excused absences.

Topics

Electrodynamics and special relativity/ Minkowski spacetime, Lorentz transformations, suffix notation for 4-vectors and tensors, proper time, 4-velocity

Maxwell's equations in 4-tensor notation; gauge potentials and gauge invariance, Lorentz transformations of E and B, Lorentz force

Action principle for charged particle, canonical momentum and Hamiltonian, relativistic particle motion in E and B fields, relativistic orbits in Coulomb potential

Action principle for electrodynamics; energy density and flux, energy-momentum tensor

Electromagnetic waves, polarization, waveguides, resonant cavities

Fields due to moving charges; retarded potentials, Lienard-Wiechert potentials, Larmor formula, angular and frequency distributions of radiated power, Cerenkov radiation, Thompson scattering

Multipole expansion, dipole radiation, higher multipoles, antennae

Electromagnetism and quantum mechanics; gauge transformations, covariant derivative, magnetic monopoles, Dirac quantisation

ADA statement

The Americans with Disabilities Act (ADA) is a federal anti-discrimination statute that provides comprehensive civil rights protection for persons with disabilities. Among other things, this legislation requires that all students with disabilities be guaranteed a learning environment that provides for reasonable accommodation of their disabilities. If you believe you have a disability requiring an accommodation, please contact Disability Services, in Cain Hall, Room B118, or call 979-845-1637. For additional information visit <http://disability.tamu.edu>.

academic integrity

The Aggie Honor Code is *"An Aggie does not lie, cheat, or steal or tolerate those who do."* For more information, refer to the Honor Council Rules and Procedures on the web at <http://www.tamu.edu/aggiehonor>.

The first part of the document discusses the importance of maintaining accurate records of all transactions. It emphasizes that every entry, no matter how small, should be recorded to ensure the integrity of the financial data. This includes not only sales and purchases but also expenses and income. The document further explains that regular reconciliation of accounts is essential to identify any discrepancies early on and prevent them from escalating into larger issues.

In addition, the document highlights the need for transparency and accountability in financial reporting. It suggests that all stakeholders should have access to the relevant information and that the reporting process should be clear and concise. This helps in building trust and ensuring that the organization's financial health is well understood by all parties involved.

The second part of the document focuses on the implementation of effective financial controls. It outlines various measures that can be taken to minimize the risk of fraud and errors, such as separating duties, requiring approvals for transactions, and conducting regular audits. The document also discusses the importance of staying up-to-date with the latest financial regulations and standards to ensure compliance.

Finally, the document concludes by emphasizing the role of financial management in the overall success of the organization. It states that sound financial practices are not just about keeping the books balanced but also about making informed decisions that drive growth and profitability. By following the guidelines provided, organizations can achieve financial stability and long-term success.

RECEIVED

JAN 16 2013

AS

GRADUATE STUDIES

Texas A&M University
Departmental Request for a Change in Course
Undergraduate ♦ Graduate ♦ Professional

• Submit original form and attachments •

1. Request submitted by (Department or Program Name): Physics and Astronomy
2. Course prefix, number and complete title of course: PHYS 615 Methods of Theoretical Physics I

Attach a brief supporting statement for changes made to items 3a thru 3d, and 6 below.

- 3. Change requested
a. Prerequisite(s): From: To:
b. Withdrawal (reason):
c. Cross-list with:
d. Change in course title and description. Enter complete current course title and current course description in item 5; enter proposed course title and proposed course description in item 6. Complete item 7 for change in title.
e. Change in course number, contact hours (lab & lecture), and semester credit hours. Complete item 7. Attach a course syllabus.
4. For informational purposes only, please indicate course number if this course will be stacked:
5. Complete current course title and current catalog course description:

Cross-listed courses require the signature of both department heads.

6. Complete proposed course title and proposed catalog course description (not to exceed 50 words):

7. a. As currently in course inventory:

Table with columns: Prefix, Course #, Title, Lect., Lab, SCH, CIP and Fund Code, Admin. Unit, FICE Code, Level. Contains data for PHYS 615 METH OF THRTCL PHYS I.

b. Change to:

Table with columns: Prefix, Course #, Title, Lect., Lab, SCH, CIP and Fund Code, Admin. Unit, Acad. Year, FICE Code, Level. Contains data for PHYS 615 METH OF THRTCL PHYS I.

Approval recommended by:

George R. Welch 11.21.2012
Department Head or Program Chair (Type Name & Sign) Date

Department Head of Program Chair (Type Name & Sign) Date
(if cross-listed course)

Submitted to Coordinating Board by:

Associate Director, Curricular Services

Chair, College Review Committee 12-10-12
Date

Dean of College 1-9-13
Date

Chair, GC or UCC 2-7-13
Date

Date

Effective Date

PHYS 615 — Methods of Theoretical Physics I

PHYS 615: Methods of Theoretical Physics I
spring 2013

Instructor

Dr. Ergin Sezgin
sezgin@physics.tamu.edu
MIST M521
979.845.7795

Course meetings

TR 2:20-3:35pm in MPHY 107

Final exam

Wednesday, May 8, 2013; 1:00-3:00pm

Course (catalog) description

Orthogonal eigenfunctions with operator and matrix methods applied to solutions of the differential and integral equations of mathematical physics; contour integration, asymptotic expansions of Fourier transforms, the method of stationary phase and generalized functions applied to problems in quantum mechanics.

Prerequisites

MATH 311, 407, and 412 or equivalents

Texts

recommended

Mathematical Methods of Physics, 2nd ed.; 1970
by Jon Mathews and Robert L. Walker
publisher: W. A. Benjamin
ISBN-10: 0805370021
ISBN-13: 978-0805370027

Grading

50% homework assignments, plus class participation
25% two midterms
25% final exam
See <http://student-rules.tamu.edu/rule07> for information on University-excused absences.

examinations

The first midterm will be administered approximately six weeks into the semester; the second midterm will follow approximately six weeks after the first exam. No books or notes will be permitted during examinations. The final exam will cover all topics discussed in class.

homework

Weekly problem sets will be required. There will be a total of twelve sets during the semester. Students may work together on the problem assignments, but each student must turn in solutions written entirely in his/her own handwriting. Active participation in class by asking or answering questions will also count towards grades. An extension of the deadline to turn in homework may be approved in special situations, but homework will not be accepted after the solutions have been posted.

Topics

Differential equations of physics; first-order equations, separation of variables

Legendre equation, properties of Legendre polynomials, generating function, Rodrigues' formula, Associated Legendre functions, spherical harmonics

Singular points of second-order ODEs, Wronskian, series solutions, Green-function methods, Sturm-

Liouville theory

Functions of a complex variable; complex numbers, analytic functions, contour integration, classification of singularities, calculus of residues, evaluation of real integrals, summation of series, analytic continuation

Gamma function, Riemann zeta function, asymptotic expansions, method of steepest descent

Cartesian vectors and tensors, rotation group, tensor calculus

ADA statement

The Americans with Disabilities Act (ADA) is a federal anti-discrimination statute that provides comprehensive civil rights protection for persons with disabilities. Among other things, this legislation requires that all students with disabilities be guaranteed a learning environment that provides for reasonable accommodation of their disabilities. If you believe you have a disability requiring an accommodation, please contact Disability Services, in Cain Hall, Room B118, or call 979-845-1637. For additional information visit <http://disability.tamu.edu>.

academic integrity

The Aggie Honor Code is *"An Aggie does not lie, cheat, or steal or tolerate those who do."* For more information, refer to the Honor Council Rules and Procedures on the web at <http://www.tamu.edu/aggiehonor>.

the 1990s, the number of people with a mental health problem has increased in the UK, and the number of people with a mental health problem who are in contact with mental health services has also increased (Mental Health Act 1983, 1990, 1994, 1997, 2003).

There is a growing awareness of the need to improve the lives of people with a mental health problem, and to reduce the stigma and discrimination that they experience. This has led to a number of initiatives to improve the lives of people with a mental health problem, and to reduce the stigma and discrimination that they experience.

One of the most important initiatives is the development of self-help materials. Self-help materials can help people with a mental health problem to understand their condition, and to manage their symptoms. Self-help materials can also help people with a mental health problem to reduce the stigma and discrimination that they experience.

Self-help materials can be developed in a number of ways. They can be developed as books, leaflets, or audio or video recordings. Self-help materials can be developed for people with a range of mental health problems, and for people with different levels of understanding.

Self-help materials can be developed for people with a range of mental health problems, and for people with different levels of understanding. Self-help materials can be developed for people with a range of mental health problems, and for people with different levels of understanding.

Self-help materials can be developed for people with a range of mental health problems, and for people with different levels of understanding. Self-help materials can be developed for people with a range of mental health problems, and for people with different levels of understanding.

Self-help materials can be developed for people with a range of mental health problems, and for people with different levels of understanding. Self-help materials can be developed for people with a range of mental health problems, and for people with different levels of understanding.

Self-help materials can be developed for people with a range of mental health problems, and for people with different levels of understanding. Self-help materials can be developed for people with a range of mental health problems, and for people with different levels of understanding.

Self-help materials can be developed for people with a range of mental health problems, and for people with different levels of understanding. Self-help materials can be developed for people with a range of mental health problems, and for people with different levels of understanding.

Self-help materials can be developed for people with a range of mental health problems, and for people with different levels of understanding. Self-help materials can be developed for people with a range of mental health problems, and for people with different levels of understanding.

Self-help materials can be developed for people with a range of mental health problems, and for people with different levels of understanding. Self-help materials can be developed for people with a range of mental health problems, and for people with different levels of understanding.

Self-help materials can be developed for people with a range of mental health problems, and for people with different levels of understanding. Self-help materials can be developed for people with a range of mental health problems, and for people with different levels of understanding.

Self-help materials can be developed for people with a range of mental health problems, and for people with different levels of understanding. Self-help materials can be developed for people with a range of mental health problems, and for people with different levels of understanding.

RECEIVED

JAN 16 2013

AS

GRADUATE STUDIES

Texas A&M University
Departmental Request for a Change in Course
Undergraduate ♦ Graduate ♦ Professional

• Submit original form and attachments •

- 1. Request submitted by (Department or Program Name): Physics and Astronomy
2. Course prefix, number and complete title of course: PHYS 619 Modern Computational Physics

Attach a brief supporting statement for changes made to items 3a, then 3d, and e below.

- 3. Change requested
a. Prerequisite(s): From: To:
b. Withdrawal (reason):
c. Cross-list with:
d. Change in course title and description. Enter complete current course title and current course description in item 5; enter proposed course title and proposed course description in item 6. Complete item 7 for change in title.
e. Change in course number, contact hours (lab & lecture), and semester credit hours. Complete item 7. Attach a course syllabus.
4. For informational purposes only, please indicate course number if this course will be stacked:
5. Complete current course title and current catalog course description:

Cross-listed courses require the signature of both department heads.

- 6. Complete proposed course title and proposed catalog course description (not to exceed 50 words):

- 7. a. As currently in course inventory:

Table with 3 rows: Prefix (PHYS 619), Title (MOD COMPUTATIONAL PHYS), and a grid of numbers for Lect, Lab, SCH, CIP and Fund Code, Admin. Unit, FICE Code, and Level.

- b. Change to:

Table with 3 rows: Prefix (PHYS 619), Title (MOD COMPUTATIONAL PHYS), and a grid of numbers for Lect, Lab, SCH, CIP and Fund Code, Admin. Unit, Acad. Year, FICE Code, and Level.

Approval recommended by:

George R. Welch 11.27.2012
Department Head or Program Chair (Type Name & Sign) Date

Chair, College Review Committee 12-10-12
Date
Dean of College 1-9-13
Date

Submitted to Coordinating Board by:

Chair, GC or MCC 2-7-13
Date

Associate Director, Curricular Services

Date Effective Date

Department of Physics

 Helmut G. Katzgraber
Associate Professor

PHYS 619 – Computational Physics (Spring 2014)

Meeting times	Lecture	Monday and Wednesday	12:40 – 13:30 (MPHYS 213)
	Lab	Monday	15:00 – 16:40 (MPHYS 330A)

Course description Introduction to computational and simulational techniques widely used in physics applications and research, including trajectory integration, wave motion analysis, molecular dynamics, (quantum) Monte Carlo methods, statistical mechanics of spin systems, phase transitions, quantum evolution, bound state problems, and variational methods. Introduction to computer architectures, GPU and HPC programming for physicists. 3 credits.

Prerequisites PHYS 408 (or equivalent)
PHYS 412 (or equivalent)
knowledge of a high-level language such as C (via CSCE 206 or equivalent) and a scripting language

Course website <http://katzgraber.org/teaching/SS14-401-619> (all information posted online)

Instructor Helmut G. Katzgraber
MPHYS 409
hgk@tamu.edu
979 845 8532

Office Hours by appointment

TA Ross McDonald

Grading Policies	Lab	20%
	Homework	20%
	Semester-long project	40%
	Written report	10%
	End-of-semester Presentation	10%

Note that there will be no midterms or a final exam. If you score 70% or lower in the lab, you fail the course. The projects will be distributed in the first week.

Mitchell Physics Building
4242 TAMU
College Station TX 77843-4242, USA

Telephone: (979) 845 8532
Fax: (979) 845 2590
Email: hgk@tamu.edu
Web: <http://katzgraber.org>

Department of Physics

Helmut G. Katzgraber
Associate Professor

Textbook The lecture notes will serve as cliff notes to multiple textbooks that will be introduced in the first lecture.

Syllabus

1. Introduction to programming techniques and computer architectures via numerical solutions of ODEs (e.g., Euler, Runge-Kutta).
2. Harmonic oscillators (Verlet and symplectic methods), transition to chaos (Lyapunov exponents, logistic map, ...), Duffing equation.
3. Kepler problem (deviations from $1/r^2$ orbits, 3-body problem).
4. Partial differential equations (Laplace, Poisson equations).
5. Fractals (Newton-Raphson, Mandelbrodt, Sierpinsky).
6. Random systems: Random-number generators, random walks, percolation.
7. Statistical mechanics and phase transitions (Ising model, Monte Carlo methods, first vs second-order phase transitions).
8. Statistical data analysis (fitting, plotting, ...)
9. Molecular dynamics
10. Quantum mechanics (shooting and matching methods, matrix methods, exact diagonalization, variational approaches and quantum Monte Carlo methods).

Mitchell Physics Building
4242 TAMU
College Station TX 77843-4242, USA

Telephone: (979) 845 8532
Fax: (979) 845 2590
Email: hgk@tamu.edu
Web: <http://katzgraber.org>

Department of Physics

Helmut G. Katzgraber
Associate Professor

Lab component

1. Development of proper coding techniques and provenance. Use of common tools such as version control systems, debuggers, profilers. Code optimization to illustrate different computer hardware components.
2. Introduction to symbolic programming with Mathematica by applying the concepts learned in class to chaotic systems (Duffing equation and damping).
3. Kepler problem, programming anharmonic oscillators with high-level languages.
4. Numerical determination of electric field distributions (introduction to GPU computing).
5. Using symbolic languages to efficiently study fractal systems (emphasis on graphical display of the results).
6. Good vs bad random number generators, tests, efficient implementations. Introduction to MPI and parallel programming illustrated via the computation of π using random sampling on multi-core systems.
7. Importance vs simple sampling, Markov chains, simulation of the one-dimensional Ising model (in class from scratch).
8. Hands-on statistical data analysis lab, computing error bars via bootstrap and jackknife methods. Fitting and plotting with gnuplot.
9. Solidification and melting transition, jamming of granular systems.
10. Solving of time-independent Schrödinger equations, variational methods (harmonic oscillator), matrix methods (anharmonic oscillator), shooting, quantum Monte Carlo.
11. Introduction to the LaTeX typesetting language. Presentation skills.

Mitchell Physics Building
4242 TAMU
College Station TX 77843-4242, USA

Telephone: (979) 845 8532
Fax: (979) 845 2590
Email: hgk@tamu.edu
Web: <http://katzgraber.org>

Department of Physics

Helmut G. Katzgraber
Associate Professor

Semester-long projects

These shall be tackled by teams of 2 – 3 students. Topics include: two-dimensional Ising model with cluster algorithms, hysteresis in magnetic materials with randomness, computing electric field distributions of complex geometries with GPUs, parallel molecular dynamics simulations, etc.

ADA Policy Statement

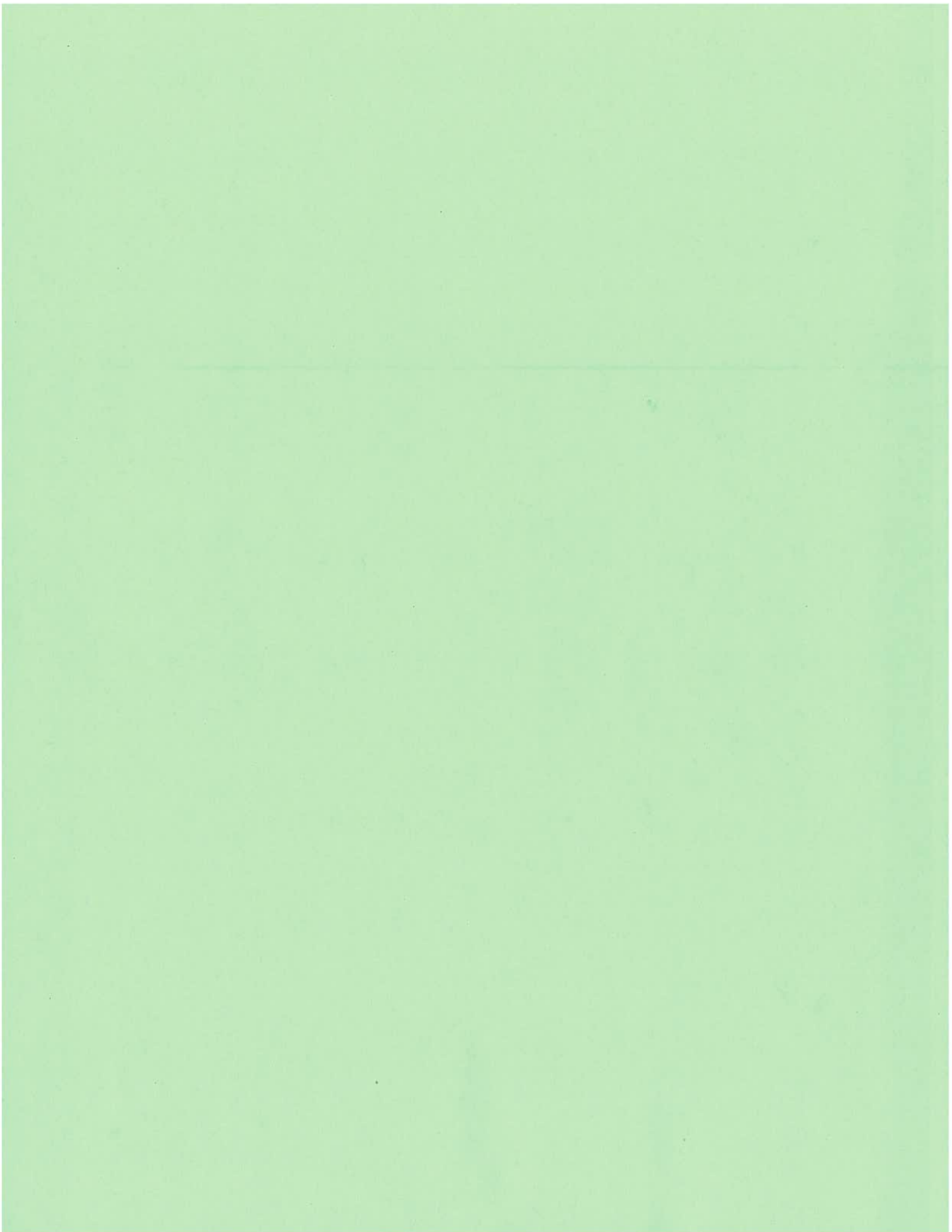
The Americans with Disabilities Act (ADA) is a federal anti-discrimination statute that provides comprehensive civil rights protection for persons with disabilities. Among other things, this legislation requires that all students with disabilities be guaranteed a learning environment that provides for reasonable accommodation of their disabilities. If you believe you have a disability requiring an accommodation, please contact Disability Services, in Cain Hall, Room B118, or call 845-1637. For additional information visit <http://disability.tamu.edu>.

Academic Integrity Statement

"An Aggie does not lie, cheat or steal, or tolerate those who do." See <http://aggiehonor.tamu.edu>.

Mitchell Physics Building
4242 TAMU
College Station TX 77843-4242, USA

Telephone: (979) 845 8532
Fax: (979) 845 2590
Email: hgk@tamu.edu
Web: <http://katzgraber.org>



RECEIVED

JAN 16 2013 JS

GRADUATE STUDIES

Texas A&M University
Departmental Request for a Change in Course
Undergraduate ♦ Graduate ♦ Professional

• Submit original form and attachments •

- 1. Request submitted by (Department or Program Name): Physics and Astronomy
2. Course prefix, number and complete title of course: PHYS 624 Quantum Mechanics

Attach a brief supporting statement for changes made to items 3a thru 3d, and 6 below.

- 3. Change requested
a. Prerequisite(s): From: To:
b. Withdrawal (reason):
c. Cross-list with:
d. Change in course title and description. Enter complete current course title and current course description in item 5; enter proposed course title and proposed course description in item 6. Complete item 7 for change in title.
e. Change in course number, contact hours (lab & lecture), and semester credit hours. Complete item 7. Attach a course syllabus.
4. For informational purposes only, please indicate course number if this course will be stacked:
5. Complete current course title and current catalog course description:

Cross-listed courses require the signature of both department heads.

- 6. Complete proposed course title and proposed catalog course description (not to exceed 50 words):

- 7. a. As currently in course inventory:

Table with columns: Prefix, Course #, Title, Lect., Lab, SCH, CIP and Fund Code, Admin. Unit, FICE Code, Level. Row 1: PHYS 624 QUANTUM MECHANICS, 04000440080100022300003632

- b. Change to:

Table with columns: Prefix, Course #, Title, Lect., Lab, SCH, CIP and Fund Code, Admin. Unit, Acad. Year, FICE Code, Level. Row 1: PHYS 624 QUANTUM MECHANICS, 0300034008010002230019-14003632

Approval recommended by:

George R. Welch 11.21.2012
Department Head or Program Chair (Type Name & Sign) Date

Department Head or Program Chair (Type Name & Sign) Date
(if cross-listed course)

Submitted to Coordinating Board by:

Chair, College Review Committee 12-10-12
Date

Dean of College 1-9-13
Date

Chair, GC of UCC 2-7-13
Date

Associate Director, Curricular Services

Date

Effective Date

PHYS 624: Quantum Mechanics II
fall 2012

Instructor

Dr. Valery Pokrovsky
valery@physics.tamu.edu
MPHY 457
979.845.1175

Course meetings

MW 4:10-5:25pm in MPHY 213

Final exam

Monday, May 6, 2013; 3:30-5:30pm

Course (catalog) description

Continuation of PHYS 606. Scattering theory, second quantization, angular momentum theory, approximation methods, application to atomic and nuclear systems, semiclassical radiation theory.

Prerequisites

MATH 601, PHYS 412 or equivalents

Texts

required

Quantum Mechanics, 3rd ed.; Dec 1997
by Eugen Merzbacher
publisher: Wiley
ISBN-10: 0471887021
ISBN-13: 978-0471887027

recommended

Quantum Mechanics Non-Relativistic Theory, 3rd ed., vol. 3; 2000
by L. D. Landau and E. M. Lifshitz
publisher: Butterworth-Heinemann
ISBN-10: 0750635398
ISBN-13: 978-0750635394

recommended

Modern Quantum Mechanics, 2nd ed.; Jul 2010
by J. J. Sakurai and Jim J. Napolitano
publisher: Addison Wesley
ISBN-10: 0805382917
ISBN-13: 978-0805382914

Grading

50% homework assignments
50% two (2) exams
A = 90% or higher
B = 80%-90%
C = 60%-80%

See <http://student-rules.tamu.edu/rule07> for information on University-excused absences.

Topics

- Elementary scattering theory; phase shifts and scattering; low and high-energy scattering; Lippmann-Schwinger formalism; Higher Born approximations; resonance scattering.
- Spin; SO(3) group and its irreducible representations; spin-orbit coupling; spin in magnetic field.
- Addition of angular momenta.

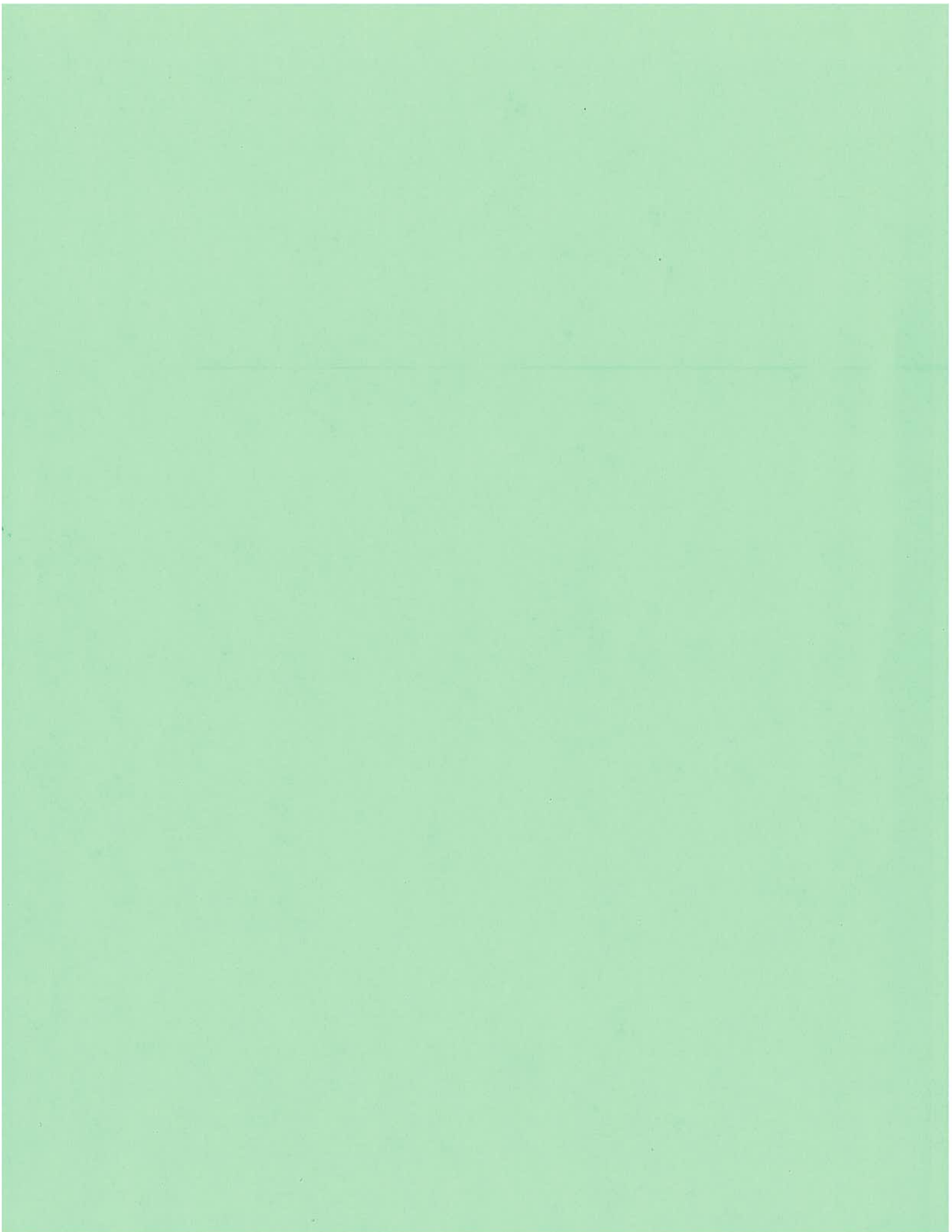
- Discrete symmetries: P, CP, CPT; time reversal invariance; Kramers degeneration.
- Propagators and path integrals; quantum interference phenomena: gravitational interference, Aharonov-Bohm effect.
- Adiabatic approximation; Berry's phase; Landau-Zener theory.
- Many-body quantum mechanics; second quantization; spin and statistics; atoms and molecules; Bose-Einstein condensation.

ADA statement

The Americans with Disabilities Act (ADA) is a federal anti-discrimination statute that provides comprehensive civil rights protection for persons with disabilities. Among other things, this legislation requires that all students with disabilities be guaranteed a learning environment that provides for reasonable accommodation of their disabilities. If you believe you have a disability requiring an accommodation, please contact Disability Services, in Cain Hall, Room B118, or call 979-845-1637. For additional information visit <http://disability.tamu.edu>.

academic integrity

The Aggie Honor Code is *"An Aggie does not lie, cheat, or steal or tolerate those who do."* For more information, refer to the Honor Council Rules and Procedures on the web at <http://www.tamu.edu/aggiehonor>.



Texas A&M University
Departmental Request for a Change in Course
Undergraduate ♦ Graduate ♦ Professional

RECEIVED
JAN 28 2013
GRADUATE STUDIES

• Submit original form and attachments •

1. Request submitted by (Department or Program Name): Department of Veterinary Large Animal Clinical Sciences
 2. Course prefix, number and complete title of course: VLCS 422/622 Equine Disease and Epidemiology

Attach a brief supporting statement for changes made to items 3a thru 3d, and 6 below.

3. Change requested
- a. Prerequisite(s): From: _____ To: _____
- b. Withdrawal (reason): _____
- c. Cross-list with: _____
- Cross-listed courses require the signature of both department heads.**
- d. Change in course title and description. Enter complete current course title and current course description in item 5; enter proposed course title and proposed course description in item 6. Complete item 7 for change in title.
- e. Change in course number, contact hours (lab & lecture), and semester credit hours. Complete item 7. **Attach a course syllabus.**
4. For informational purposes only, please indicate course number if this course will be stacked: VLCS 622
5. Complete current course title and current catalog course description:
Equine Disease and Epidemiology

6. Complete proposed course title and proposed catalog course description (not to exceed 50 words):
Equine Epidemiology and Infectious Diseases

7. a. As currently in course inventory:

Prefix	Course #	Title (excluding punctuation)				
V L C S	4 2 2	E Q U I N E D I S E A S E & E P I D E M				
Lect.	Lab	SCH	CIP and Fund Code	Admin. Unit	FICE Code	Level
					0 0 3 6 3 2	

b. Change to:

Prefix	Course #	Title (excluding punctuation)					
V L C S	4 2 2	E Q U I N E E P I D E M & I N F E C T D I S					
Lect.	Lab	SCH	CIP and Fund Code	Admin. Unit	Acad. Year	FICE Code	Level
					-	0 0 3 6 3 2	

Approval recommended by:

<u>Allen J. Roussel, Jr.</u> Department Head or Program Chair (Type Name & Sign) Date <u>1/8/13</u>	<u>Jane Welsh</u> Chair, College Review Committee Date <u>1/9/13</u>
<u>Eleanor Green</u> Department Head or Program Chair (Type Name & Sign) Date (if cross-listed course)	<u>Eleanor Green</u> Dean of College Date <u>1-10-13</u>
Submitted to Coordinating Board by:	<u>[Signature]</u> Chair, GC or UCC Date <u>2-7-13</u>
Associate Director, Curricular Services	Date _____ Effective Date _____