1. **Approval of December 2012 and January 2013 Minutes**

2. **Discussion Items:**
   a. English Language Proficiency task force and TA training task force.
   b. Veterinary Professional Program reviews.

3. **New Course Requests:**
   a. ASTR 601 Extragalactic Astronomy
   b. ASTR 602 Astronomical Observing Techniques and Instrumentation
   c. ASTR 603 Stellar Astrophysics
   d. ASTR 604 Cosmology
   e. ASTR 605 Galactic Astronomy
   f. ASTR 606 Radiative Transfer
   g. ECMT 674 Economic Forecasting
   h. EDTC 641 Educational Game Design
   i. PHYS 641 Extragalactic Astronomy
   j. PHYS 642 Astronomical Observing Techniques and Instrumentation
   k. PHYS 643 Stellar Astrophysics
   l. PHYS 644 Cosmology
   m. PHYS 645 Galactic Astronomy
   n. PHYS 646 Radiative Transfer

4. **Course Change Requests:**
   a. PHYS 606 Quantum Mechanics
   b. PHYS 607 Statistical Mechanics
   c. PHYS 611 Electromagnetic Theory
   d. PHYS 615 Methods of Theoretical Physics I
   e. PHYS 619 Modern Computational Physics
   f. PHYS 624 Quantum Mechanics
   g. VLCS 622 Equine Disease and Epidemiology

5. **Special Consideration Items:**
   a. Liberal Arts: Request for name change from Master of Arts in Modern & Classical languages with an emphasis in Spanish to a Master of Arts in Hispanic Studies.
Minutes
Graduate Council Meeting Minutes

310 Jack K. Williams Administration Building

December 6, 2012

In attendance: Mark Zoran, Sam Kirkpatrick, Taylor Smith, Sara Khalifa, Nancy Duran, Doug Ecke, Sarel Lavy, George Cunningham, R. Saravanan, Leslie Feigenbaum, Scott Miller, Mark Burris, Dick Haney, Carmelita Pickett, Simon Sheather, Myra Gonzalez, David Kessler, Sandra Williams, Jana Corley

1. Approval of November 2012 Minutes

2. Discussion Item:
   a. Recommended Changes to Thesis Office Signature Requirements
      - Memorandum with recommendations discussed and will be delivered to OGS

3. New Course Requests:
   The following New Course Requests were approved by the Graduate Council with friendly amendments.
   a. ARCH 673 Design for Active Living
   b. ARCH 678 Foundations of Healthcare Design
   c. ECEN 712 Power Electronics for Photovoltaic Energy Systems
   d. ECEN 753 Theory and Applications of Network Coding
   e. EDCI 639 Grant Writing for Professional Development
   f. INFO 647 Information Systems Sourcing
   g. INFO 648 Advanced Data Management
   h. VIBS 627 Optical Microscopy and Live Cell Imaging
   i. VIZA 684 Professional Internship

4. Course Change Requests:
   The following Course Change Requests were approved by the Graduate Council with friendly amendments.
   a. ATMO 601 Principles of Atmospheric Physics and Chemistry
   b. ATMO 612 Atmospheric Physics II
   c. COSC 601 Construction Practices
   d. COSC 602 Construction Estimating
   e. COSC 603 Construction Scheduling
   f. COSC 606 Mechanical and Electrical Construction
   g. COSC 608 Structural Principles and Practices
   h. COSC 620 Construction Operations
   i. COSC 621 Advanced Topics in Construction Project Scheduling and Project Management
   j. COSC 622 Construction Resources
   k. COSC 624 Project Acquisition and Control
   l. COSC 627 Construction Dispute Resolution Alternatives
   m. COSC 628 Applications of Construction Law
   n. COSC 631 Supervision of the Construction Workforce
   o. COSC 633 International Construction Contracting
   p. COSC 641 Construction Management Communications
   q. COSC 642 Web-Based Construction Data Management
   r. COSC 644 Systems Approach to Construction Management
   s. COSC 648 Design-Build Project Delivery
5. **Special Consideration Items:**
   *The following Special Consideration Items were approved by the Graduate Council.*
   a. The College of Education and Human Development: Revisions to the Master of Education in Educational Technology
   b. College of Science: Master of Science in Analytics
   c. College of Engineering: Certificate of Quality Engineering for Regulated Medical Technologies

   *The following Special Consideration Item was tabled by the Graduate Council.*
   a. The Bush School: Curriculum Change for POLS/MPSA 3+2 Program
1. **New Course Requests:**
   
   The following New Course Requests were approved by the Graduate Council:
   
   a. AERO 670  Turbulence Modeling
   b. ENTO 645  Arthropods as Vectors of Plant Pathogens
   c. VTPP 652  Fetal and Embryo Physiology
New Courses
Texas A&M University
Departmental Request for a New Course
Undergraduate • Graduate • Professional
• Submit original form and attach a course syllabus.

1. Request submitted by (Department or Program Name): Physics and Astronomy

2. Course prefix, number and complete title of course: ASTR 601 Extragalactic Astronomy

3. Catalog course description (not to exceed 50 words):
Overview of observations of galaxies and large-scale structures in the Universe to understand their formation and evolution from theoretical and observational perspectives. Galaxy luminosity functions; evolution of stellar populations and chemical enrichment; clusters and AGN.

4. Prerequisite(s):
PHYS 601; or ASTR 314 and PHYS 302; or permission of instructor
Cross-listed with: PHYS 641
Stacked with:

5. Is this a variable credit course? [ ] Yes [ ] No
If yes, from ________ to ________

6. Is this a repeatable course? [ ] Yes [ ] No
If yes, this course may be taken ________ times.
Will this course be repeated within the same semester? [ ] Yes [ ] No

7. This course will be:
a. required for students enrolled in the following degree program(s) (e.g., B.A. in history)

b. an elective for students enrolled in the following degree program(s) (e.g., M.S., Ph.D. in geography)

MS or PhD in physics

8. If other departments are teaching or are responsible for related subject matter, the course must be coordinated with these departments. Attach approval letters.

9. Prefix
Course #
Title (excluding punctuation)

<table>
<thead>
<tr>
<th>Lect</th>
<th>Lab</th>
<th>SCH</th>
<th>GP and Fund Code</th>
<th>Admin Unit</th>
<th>Acad Year</th>
<th>HCC Code</th>
</tr>
</thead>
<tbody>
<tr>
<td>3</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>1</td>
<td>1</td>
<td>0</td>
</tr>
</tbody>
</table>

Approval recommended by:

George R. Welch
Department Head or Program Chair (Type Name & Sign) 11/25/2012

George R. Welch
Department Head or Program Chair (Type Name & Sign) 11/25/2012
(if cross-listed course)

Submitted to Coordinating Board by:

Associate Director, Curricular Services

Questions regarding this form should be directed to Sandra Williams at 845-8201 or sandra.williams@tamu.edu.
Curricular Services – 3/10
This course provides an overview of observations of galaxies in the Universe. The goal of this
course is to provide an advanced understanding of the formation and evolution of galaxies and
large-scale structures in the Universe both from a theoretical and observational perspective.
Specific topics will include the formation of structure in the early Universe, the distribution of
galaxy properties, galaxy number counts and luminosity functions. The course will discuss the
evolution of stellar populations and chemical enrichment in galaxies. Other topics include
galaxy groups, galaxy clusters, and the effects of these dense environments on galaxy
evolution. The course will also include an overview of active galaxies (radio galaxies, quasars,
other AGN) and their relationship to galaxies.

Grading Policy  Your final grade will be a combination of the grades from the final exam
(20%), three homework projects (3 x 20% = 60%), and attendance and
in-class participation (20%).

Prerequisites  PHYS 601, or ASTR 314 and PHYS 302, or permission of instructor

Absences  Attendance and in-class participation account for 10% of your grade.
Only officially excused absences as outlined by the University
Regulations will be accepted, see:
http://student-rules.tamu.edu/rule07
If you know you will be absent, please contact the instructor as soon as
possible.
ASTR 601 : Extragalactic Astronomy
Fall 2012

Homework Projects and Final Exam

The majority of your grade will be based on homework assignments, due about every 4 weeks. These will be handed out in class and due 2 weeks later. All assignments must be submitted as PDF documents made using LATEX. You must email your PDF document to the professor by 11:59 pm on the due date.

I recommend using the AASTEX template provided by the AAS.
http://aastex.aas.org

Documentation is available here:
http://aastex.aas.org/docs.html

I also recommend you obtain one or both of the following books:
The LATEX Companion (Tools and Techniques for Computer Typesetting)

ADA Policy

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 the Department of Student Life, Services for Students with Disabilities, in Room 126 of the Koldus Building or call 845-1637.

Honor Code

I consider it a privilege to work with students of such character as that of Aggies. The honor code sets Texas A&M apart from other universities, see http://www.tamu.edu/aggiehonor, and you should be proud of the standard this sets. I expect that you will uphold the Aggie principle, "An Aggie does not lie, cheat, or steal or tolerate those who do." On all quizzes, exams and the essay you should abide by the Aggie code of conduct, "On my honor as an Aggie, I have neither given nor received unauthorized aid on this academic work." For homework, I encourage you to talk to other students and to help each other as you will all learn better this way. However, the work you turn in should be your own, never copied from another student.
## ASTR 601: Extragalactic Astronomy
### Fall 2012

<table>
<thead>
<tr>
<th>Lecture</th>
<th>Tentative Syllabus (subject to change)</th>
<th>Assignment(s)</th>
<th>Due Date</th>
</tr>
</thead>
<tbody>
<tr>
<td>Week 1</td>
<td>Preliminaries, Radiation, Magnitudes, Stars, Stellar Populations</td>
<td>Schneider Appendixes</td>
<td>8/30</td>
</tr>
<tr>
<td></td>
<td><strong>Homework Assignment #1 Due</strong></td>
<td></td>
<td>9/21</td>
</tr>
<tr>
<td></td>
<td><strong>Homework Assignment #2 Due</strong></td>
<td></td>
<td>10/19</td>
</tr>
<tr>
<td></td>
<td><strong>Homework Assignment #3 Due</strong></td>
<td></td>
<td>11/16</td>
</tr>
<tr>
<td></td>
<td><strong>Final due</strong></td>
<td></td>
<td>12/7</td>
</tr>
</tbody>
</table>
Texas A&M University
Departmental Request for a New Course
Undergraduate • Graduate • Professional
• Submit original form and attach a course syllabus.

1. Request submitted by (Department or Program Name): Physics and Astronomy

2. Course prefix, number and complete title of course: ASTR 602 Astronomical Observing Techniques and Instrumentation

3. Catalog course description (not to exceed 50 words):
Theory and practice of obtaining and analyzing astrometric, photometric, spectroscopic, and interferometric measurements of astronomical sources across the electromagnetic spectrum. Principles of design, fabrication, assembly, test, deployment, and use of astronomical instruments.

4. Prerequisite(s):
   PHYS 815 or equivalent; or permission of instructor
   
   Cross-listed with: PHYS 842

5. Is this a variable credit course? ☑ Yes ☐ No If yes, from _______ to _______

6. Is this a repeatable course? ☑ Yes ☐ No If yes, this course may be taken _______ times.
   Will this course be repeated within the same semester? ☑ Yes ☐ No

7. This course will be:
   a. required for students enrolled in the following degree programs(s) (e.g., B.A. in history)
   b. an elective for students enrolled in the following degree program(s) (e.g., M.S., Ph.D. in geography)

MS or PhD in physics

8. If other departments are teaching or are responsible for related subject matter, the course must be coordinated with these departments. Attach approval letters.

9. Prefix  Course#  Title (excluding punctuation)
   ASTR  602  ASTR OBSV TECH & INSTR
   
   Lect  Lab  SCH  CRF and Fund Code
   0  3  0  0  3  4  0  2  0  2  0  1  0  0  2  3  0  4  1  3  -  1  4  0  0  3  6  3  2

   Approval recommended by:
   George R. Welch
   Department Head or Program Chair (Type Name & Sign) Date 12-10-12

   Chair, College Review Committee Date
   Dean of College Date

   Submitted to Coordinating Board by:
   Chair, GC or UCC Date

   Effective Date

Questions regarding this form should be directed to Sandra Williams at 845-8201 or sandra-williams@tamu.edu.
Curricular Services – 3/10
Astronomy 602: Astronomical Observing Techniques and Instrumentation

Purpose
This course provides an opportunity for the students to acquaint themselves with the basic techniques of how to obtain meaningful astronomical data and the principles of astronomical instrumentation. It will introduce analysis tools (IRAF, IDL, AIPS, etc.) and statistical techniques (correlation, regression, $\chi^2$, non-parametric) that are commonly used in astronomical research. Course participants will also learn to use a telescope and modern astronomical detector systems in a night-time research setting.

Course Description
This course covers the theory and practice of obtaining astronomical data. Specific topics include the astrometric, photometric, spectroscopic, and interferometric measurement of astronomical sources across the electromagnetic spectrum. There is an introduction to statistical analysis of astronomical data that includes signal detection, signal-to-noise estimates, model fitting, good-of-fit estimation, and non-parametric techniques. There is discussion of the techniques and practices of the design, fabrication, assembly, test, deployment, and use of modern astronomical instruments.

Instructor
Prof. Darren Depoy, Mitchell Institute for Fundamental Physics & Astronomy 420

Course Materials
Course handouts and notes will also be available.

Course Grade
The course grade will be assigned on the basis of exam performance (33%), assigned homework (33%), and an oral presentation describing some astronomical instrumentation system (33%).

Exams
There will be two in-class exams (mid-term and final) over material presented in the course lectures. Each will contain short-answer and essay questions that will require calculation and quantitative estimates.

Homework
There will be homework problems assigned throughout the semester. Each problem will require the student to investigate an aspect of instrument design (throughput, resolution, bandpass, etc.).

Presentation
Each student will prepare a written report and give an oral presentation on an existing or planned astronomical instrument (telescope, satellite, etc.).
ADA Policy
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 special accommodation, please contact the Department of Student Life, Services for Students with Disabilities, in Room 126 of the Koldus Building or call 845-1637.

Honor Code
Texas A&M University assumes that all students enroll in its programs with a serious learning purpose and expects them to be responsible individuals who demand of themselves high standards of honesty and personal conduct. All students are expected to behave at all times with respect and courtesy toward their fellow students and instructors and are to have the highest standards of honesty and integrity in their academic performance. Any behavior which disrupts the classroom learning environment or any attempt to present work that the student has not actually prepared as their own work, or to pass an examination by improper means, is regarded as a serious offense. The minimum penalty for such an offense is a failing grade for this course. Aiding and abetting the above behavior is also considered a serious offense resulting in equally severe penalties.

I consider it a privilege to work with students of such character as that of Aggies. The Honor Code sets Texas A&M apart from other universities, and you should be proud of the standard this sets. I expect that you will abide by the Aggie Code of Honor:

The Aggie Honor Code: An Aggie does not lie, cheat or steal, or tolerate those who do

Further information regarding the Honor Council Rules and Procedures may be found on the web at http://www.tamu.edu/aggiehonor

Course Outline

Weeks 1-2: Introduction and Positional Astronomy (coordinate systems, spherical geometry, precession, time, right ascension and declination). Detection of a signal (signal-to-noise ratio). Statistics (sample and parent population, mean and variance, Poisson and Gaussian distributions, regression, correlation, \( \chi^2 \), etc.)

Weeks 3-4: Non-parametric statistics: non-Gaussian distribution functions (exponential, Cauchy, beta, Student’s \( t \), Pareto) and appropriate applications, mean and variance, non-parametric tests (Pearson’s \( \chi^2 \), Kolmogorov-Smirnov, von Mises, Anderson-Darling, Mann-Whitney U, Spearman’s Rank, Kendall’s \( \tau \), etc.) and appropriate application. Multivariate analysis (principal component, discriminant, clustering, etc.). Time series analysis. Bayes’ theorem and examples. Fisher matrices and joint probability.

Weeks 5-6: Photon detectors (semiconductors, photodiodes, CCDs, infrared arrays, bolometers, heterodyne mixing, antenna theory). Instrumental signatures and noise sources (dark current, Johnson
noise, electronic noise sources, pixel-to-pixel variations in quantum efficiency, etc.). Image analysis and data processing (IRAF, IDL, etc.). Signal-to-noise estimates and predictions.

**Weeks 7-8:** Optics (geometric optics, telescope design, aberrations, physical optics, elementary optical design). Atmospheric effects (refraction, seeing, observatory sites and selection criteria, extinction and emission, adaptive optics). Practical considerations in instrumentation design (finite element and flexure analysis, cryogenic systems and cooling design, scattered and stray light analysis and control, calibration unit design, etc.)

**Weeks 9-11:** Photometry (photometric and radiometric concepts, magnitudes, photometric systems, absolute calibration, signal-to-noise calculation, etc.). Definition and design of filters. Photometry from a photographic plate. Design of a photometer (photomultiplier tubes, field lens, stops, readout electronics). Design of an imaging system (CCDs, optics, structural analysis, cryogenics, etc.).

**Weeks 12-14:** Spectroscopy: design of a slit spectrometer, dispersers (prisms, gratings, grisms, volume-phase holographic gratings), and other practical considerations. Analysis of spectroscopic data and removal of instrumental effects. Spectroscopy in the infrared. Other assorted spectroscopic techniques (Fourier transform spectroscopy, heterodyne techniques, Fabry-Perot interference, etc.). Design considerations for multi-object spectrographs (fibers, slit masks, etc.). Signal-to-noise calculations.

**Week 15:** Special topics: Radio, sub-mm, and x-ray astronomy; space astronomy and satellite design, etc. Neutrino and Gravitational Wave astronomy.
Texas A&M University
Departmental Request for a New Course
Undergraduate ♦ Graduate ♦ Professional
• Submit original form and attach a course syllabus.

1. Request submitted by (Department or Program Name): Physics and Astronomy

2. Course prefix, number and complete title of course: ASTR 603 Stellar Astrophysics

3. Catalog course description (not to exceed 50 words):
Theoretical and observational aspects of stellar astrophysics. Thermodynamic properties of stellar interiors; energy sources; nuclear processes and burning stages; convective and radiative energy transport; evolutionary models; atmospheres; stability and pulsations; chemical enrichment processes; population synthesis.

4. Prerequisite(s): PHYS 636 and PHYS 607 or equivalents; or permission of instructor

5. Is this a variable credit course? ☑ No

6. Is this a repeatable course? ☑ No

7. This course will be:
a. required for students enrolled in the following degree programs(s) (e.g., B.A. in history)

b. an elective for students enrolled in the following degree program(s) (e.g., M.S., Ph.D. in geography)

MS or PhD in physics

8. If other departments are teaching or are responsible for related subject matter, the course must be coordinated with these departments. Attach approval letters.

9. Prefix Course # Title (excluding punctuation)

<p>| | | | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>ASTR</td>
<td>603</td>
<td>STELLAR ASTROPHYSICS</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Lect</th>
<th>Lab</th>
<th>SCH</th>
<th>CR and Fund Code</th>
<th>Admin Unit</th>
<th>Acad Year</th>
<th>HFL Code</th>
</tr>
</thead>
<tbody>
<tr>
<td>0</td>
<td>3</td>
<td>0</td>
<td>0 0 3 4 0 2 0 2 0 1 0 0 2 3 0 4 1 3 0 0 0 3 6 3 2</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Approval recommended by:

George R. Welch
Department Head or Program Chair (Type Name & Sign) Date: 11-28-2012

Chair, College Review Committee Date: 12-10-12

Dean of College Date: 1-9-13

Submitted to Coordinating Board by:

Chair, GC or UCC Date: 

Effective Date:

Questions regarding this form should be directed to Sandra Williams at 845-8201 or sandra.williams@tamu.edu.
Curricular Services – 3/10
Astronomy 603: Stellar Astrophysics

Purpose
This course will give the students a thorough introduction to stellar astrophysics at a graduate level. It will cover the physical processes that take place in all layers of a star, from the core to the atmosphere. It will explore the temporal evolution of stars, from protostellar cores to core burning and beyond. It will discuss the stability of stellar atmospheres and pulsation mechanisms.

Course Description
This course covers the theoretical and observational aspects of stellar astrophysics. Specific topics include: thermodynamic properties of stellar interiors, energy sources, nuclear processes and burning stages, convective and radiative energy transport, evolutionary models, atmospheres, stability and pulsations, chemical enrichment processes and population synthesis.

Course Materials
Course handouts and notes will also be available.

Course Grade
The course grade will be assigned on the basis of exam performance (40%), assigned homework (30%), an oral presentation (15%) and in-class participation in the discussion of papers.

Exams
There will be two take-home exams (mid-term and final) over material presented in the course lectures. Each will contain questions that will require calculation and quantitative estimates.

Homework
There will be six homework problems assigned throughout the semester. Some problems will require the students to write computer programs to simulate astrophysical process associated with stars.

Presentation
Each student will prepare a 20-minute presentation on one of the topics covered during the course. These presentations will take place at the end of the semester.

ADA Policy
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 special accomodation, please contact the Department of Student Life, Services for Students with Disabilities, in Room 126 of the Koldus Building or call 845-1637.
Honor Code
Texas A&M University assumes that all students enroll in its programs with a serious learning purpose and expects them to be responsible individuals who demand of themselves high standards of honesty and personal conduct. All students are expected to behave at all times with respect and courtesy toward their fellow students and instructors and are to have the highest standards of honesty and integrity in their academic performance. Any behavior which disrupts the classroom learning environment or any attempt to present work that the student has not actually prepared as their own work, or to pass an examination by improper means, is regarded as a serious offense. The minimum penalty for such an offense is a failing grade for this course. Aiding and abetting the above behavior is also considered a serious offense resulting in equally severe penalties.

I consider it a privilege to work with students of such character as that of Aggies. The Honor Code sets Texas A&M apart from other universities, and you should be proud of the standard this sets. I expect that you will abide by the Aggie Code of Honor:

The Aggie Honor Code: An Aggie does not lie, cheat or steal, or tolerate those who do

Further information regarding the Honor Council Rules and Procedures may be found on the web at http://www.tamu.edu/aggiehonor

Course Outline

Weeks 1-3:

Weeks 4-6:
Star formation and YSOs. Main sequence stars. Late stages of evolution. Binary systems. Thermodynamic properties: ideal gas with radiation; ionized real gas; the Saha equation. degenerate matter; equation of state.

Weeks 7-9:

Weeks 10-12:

Weeks 13-14: Student presentations. Review for final exam.
Texas A&M University
Departmental Request for a New Course
Undergraduate • Graduate • Professional
• Submit original form and attach a course syllabus.

1. Request submitted by (Department or Program Name):
   Physics and Astronomy

2. Course prefix, number and complete title of course:
   ASTR 604 Cosmology

3. Catalog course description (not to exceed 50 words):
   Basic principles of modern cosmology and particle physics. General relativity; cosmic inflation; Big Bang
   nucleosynthesis; expansion of the universe; cosmic microwave background; large-scale structure of the Universe;
   properties of particles; dark matter; dark energy.

4. Prerequisite(s):
   PHYS 615 or equivalent; or permission of instructor
   Cross-listed with: PHYS 644
   Stacked with:

5. Is this a variable credit course? □ Yes □ No
   If yes, from ______ to ______

6. Is this a repeatable course? □ Yes □ No
   If yes, this course may be taken ______ times.
   Will this course be repeated within the same semester? □ Yes □ No

7. This course will be:
   a. required for students enrolled in the following degree program(s) (e.g., B.A. in history)
   b. an elective for students enrolled in the following degree program(s) (e.g., M.S., Ph.D. in geography)

8. MS or PhD in physics

9. Prefix Course# Title (excluding punctuation)
   ASTR 604 COSMOLOGY
   Lect. Lab SCH CR and Fund Code Admin. Unit Acad. Year HCL Code
   0 3 0 0 0 3 4 0 0 2 0 2 0 1 0 0 2 3 0 4 1 3 - 1 4 0 0 3 6 3 2

   Approval recommended by:

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

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

   Submitted to Coordinating Board by:
   Chair, GC or UCC
   Date

   Effective Date

Questions regarding this form should be directed to Sandra Williams at 845-8201 or sandra.williams@tamu.edu.
Curricular Services – 3/10
ASTR 604
PARTICLE PHYSICS AND COSMOLOGY

Instructor

Prof. Bhaskar Dutta, Texas A&M
Email: dutta@physics.tamu.edu
Phone/e-mail: 845-5359, dutta@physics.tamu.edu
Office Hours: Monday, Wednesday: 1:00-2:00 PM or by appointment

COURSE OBJECTIVES

This course will provide the basic principles of modern cosmology and particle physics, as well as their connections. This course will cover the expansion of the universe; the cosmic microwave background (CMB); the large-scale structure of the Universe; properties of particles; dark matter; Big Bang nucleosynthesis (BBN); and cosmic inflation.

TEXTBOOK: No required text book – lecture notes will be provided.

CLASS

• Class will meet at on MW 10:10–11:25am.

HOMEWORK

• There will be 4 homework assignments. These will be written assignments and reports (see the course schedule for topics). There will be exams.

GRADING

• The course grade will be evaluated on the basis of:
  100% homework (4 homework assignments)

• The following grading scale will be used: 80+=A; 70-79=B; 60-69=C; 50-59=D. Any average below 50 is failing.
Americans with Disabilities Act (ADA) Policy Statement

The Americans with Disabilities Act (ADA) is a federal anti-discrimination statue 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 the Department of Student Life, Services for Students with Disabilities, in Room 126 of the Koldus Building or call 845-1637.

Academic Integrity Statement

"An Aggie does not lie, cheat, or steal or tolerate those who do"
All work in this course will be held to the standard described in the Aggie Honor code. For further details please see the Honor Council Rules and Procedures on the web http://www.tamu.edu/aggiehonor}
Texas A&M University
Departmental Request for a New Course
Undergraduate • Graduate • Professional
• Submit original form and attach a course syllabus.

1. Request submitted by (Department or Program Name): Physics and Astronomy
2. Course prefix, number and complete title of course: ASTR 605 Galactic Astronomy
3. Catalog course description (not to exceed 50 words): Basic nature and structure of constituents of Milky Way galaxy. Distribution and motions of stars and gas; origin, evolution and distribution of large-scale chemical abundances and kinematic patterns across populations; models of galaxy formation and implications of modern observations.

4. Prerequisite(s): PHYS 601 and PHYS 807 or equivalents; or permission of instructor

5. Cross-listed with: PHYS 645

6. Is this a variable credit course? ☐ Yes ☑ No If yes, from _______ to _______

7. Is this a repeatable course? ☐ Yes ☑ No If yes, this course may be taken _______ times.

8. Will this course be repeated within the same semester? ☐ Yes ☑ No

9. This course will be:
   a. required for students enrolled in the following degree program(s) (e.g., B.A. in history)
   b. an elective for students enrolled in the following degree program(s) (e.g., M.S., Ph.D. in geography)

8. If other departments are teaching or are responsible for related subject matter, the course must be coordinated with these departments. Attach approval letters.

Questions regarding this form should be directed to Sandra Williams at 845-8201 or sandra.williams@tamu.edu.
Curricular Services – 3/10
Astronomy 605: Galactic Astronomy

Purpose
This course gives the students an opportunity to discuss the basic nature and structure of the constituents of our Milky Way galaxy. The distribution and motions of stars and gas in the Milky Way will be described and the implications for the formation of the Galaxy discussed. The large-scale distribution of chemical abundances and the patterns seen in different kinematic populations will also be presented; the original and evolution of the observed chemical abundance patterns will also be investigated. Various models of galaxy formation will also be discussed and the implications of modern observations presented.

Instructor
Prof. Nicholas Suntzeff, Mitchell Institute M513, 458-1786, nsuntzeff@tamu.edu

Course Description
An overview of the content and structure of our Milky Way Galaxy. The course will discuss the physical properties of stars and gas constituents of the Galaxy, the space distribution of stars and chemical elements, large-scale structure and kinematics, and formation scenarios. Comparison of formation models to modern observational results will also be included.

Course Materials
Course handouts and notes will also be available.

Course Grade
The course grade will be assigned on the basis of exam performance (25%), assigned homework (50%), and an oral presentation on a topic covered by the course (25%).

Exams
There will be one final exam over material presented in the course lectures. The exam will contain short-answer and essay questions that will require calculation and quantitative estimates.

Homework
There will be homework problems assigned throughout the semester.

Presentation
Each student will prepare a 30-minute presentation on a topic related to current research on Galactic astronomy.

ADA Policy
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 special accomodation, please contact the Department of Student Life, Services for Students with Disabilities, in Room 126 of the Koldus Building or call 845-1637.
Honor Code
Texas A&M University assumes that all students enroll in its programs with a serious learning purpose and expects them to be responsible individuals who demand of themselves high standards of honesty and personal conduct. All students are expected to behave at all times with respect and courtesy toward their fellow students and instructors and are to have the highest standards of honesty and integrity in their academic performance. Any behavior which disrupts the classroom learning environment or any attempt to present work that the student has not actually prepared as their own work, or to pass an examination by improper means, is regarded as a serious offense. The minimum penalty for such an offense is a failing grade for this course. Aiding and abetting the above behavior is also considered a serious offense resulting in equally severe penalties.

I consider it a privilege to work with students of such character as that of Aggies. The Honor Code sets Texas A&M apart from other universities, and you should be proud of the standard this sets. I expect that you will abide by the Aggie Code of Honor:

The Aggie Honor Code: An Aggie does not lie, cheat or steal, or tolerate those who do

Further information regarding the Honor Council Rules and Procedures may be found on the web at http://www.tamu.edu/aggiehonor

Course Outline

Weeks 1-2: Overview of the Milky Way. The historical growth of our conception of our Galaxy.

Weeks 3-4: Measurements of stars that help us understand the nature of the Milky Way: positions and coordinate systems, proper motions, parallax, radial velocities, stellar spectra, magnitudes and colors, absolute energy distributions, and a survey of astronomical catalogues and atlases.

Weeks 5-6: The physical properties of stars and the gaseous constituents of the Milky Way: stellar distances, masses and radii, analysis of stellar spectra, the systematic differences between stellar populations (spiral arms and disk populations versus halo populations), and interstellar absorption.

Weeks 7-9: The space distribution of stars and chemical elements in the Milky Way: the apparent distribution of stars, star-count analysis, the distribution of stars and the chemical elements, and the difference between stellar populations.

Weeks 10-12: Stellar kinematics: the motion of the Sun in the Milky Way, motions of disk stars, motions of halo stars, rotation kinematics of the Milky Way and other galaxies, dark matter halos.

Weeks 13-14: The large-scale distribution of gas in the Milky Way and other galaxies: neutral hydrogen, molecular clouds, the Galactic Center, mass in-fall due to collisions.

Week 15: Models of the formation of the Milky Way and other galaxies: classic monolithic collapse, hierarchical formation and accretion, observational evidence for either scenario.
Texas A&M University  
Departmental Request for a New Course  
Undergraduate • Graduate • Professional  
• Submit original form and attach a course syllabus.
ASTR 606: Radiative Processes in Stellar and Planetary Atmospheres  
Department of Physics and Astronomy

Instructor  
George Kattawar  
MPHY 555  
kattawar@physics.tamu.edu  
979.845.1180

Prerequisites: Undergraduate courses in electricity and magnetism, quantum mechanics, statistical mechanics-thermodynamics, and classical mechanics

Texts: Rybicki and Lightman, *Radiative Processes in Astrophysics*  
Bohren and Clothiaux, *Fundamentals of Atmospheric Radiation*

Course Description: This course will emphasize the physics involved in the fundamental radiative processes that occur in both stellar and planetary atmospheres. It is designed for both seniors with a good background in upper level physics courses such as electromagnetic theory, statistical mechanics-thermodynamics, and quantum mechanics, and graduate students.

Grading: midterm exam 30%  
final exam 30%  
homework 20%  
special assignments 20%

General topics to be covered  
• Fundamentals of radiative transfer  
• Radiation fields including Stokes parameters and Mueller matrix formalism  
• Radiation from moving charges  
• Bremsstrahlung and synchrotron radiation  
• Compton scattering  
• Plasma effects  
• Atomic structure and radiative transitions  
• Molecular structure and spectra  
• Elementary and advanced multiple scattering
Americans with Disabilities Act (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 the Department of Student Life, Services for Students with Disabilities, in Room B118 of Cain Hall, 979-845-1637.

Academic Integrity Statement
"An Aggie does not lie, cheat, or steal or tolerate those who do."
The Honor Council Rules and Procedures on the web http://www.tamu.edu/aggiehonor
Texas A&M University
Departmental Request for a New Course
Undergraduate • Graduate • Professional
• Submit original form and attach a course syllabus.

Form Instructions

1. Request submitted by (Department or Program Name): Department of Economics

2. Course prefix, number and complete title of course: ECMT 674: Economic Forecasting

3. Catalog course description (not to exceed 50 words):
Empirical application of econometric techniques to prediction in economics; model building and specification; examination of various modern forecasting techniques.

4. Prerequisite(s):
Graduate level; must be enrolled in the M.S. program in the department of economics; or approval of instructor.

Cross-listed with:

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

Stacked with:

5. Is this a variable credit course? □ Yes □ No
If yes, from _______ to _______

6. Is this a repeatable course? □ Yes □ No
If yes, this course may be taken ______ times.
Will this course be repeated within the same semester? □ Yes □ No

7. This course will be:
   a. required for students enrolled in the following degree programs(s) (e.g., B.A. in history)

   M.S. in Economics

   b. an elective for students enrolled in the following degree program(s) (e.g., M.S., Ph.D. in geography)

8. If other departments are teaching or are responsible for related subject matter, the course must be coordinated with these departments. Attach approval letters.

9. Prefix: ECMT
   Course #: 674
   Title (excluding punctuation): Economic Forecasting

   Lect. Lab SCH CHP and Fund Code Admin. Unit Acad. Year UCE Code
   0 3 0 0 0 3 4 5 0 6 0 3 0 0 0 1 0 8 1 0 1 3 - - 4 0 0 3 6 3 2

   Approval recommended by:

   Timothy Groenberg □ 1/1/07
   Chair, College Review Committee □ 1-29-13
   Department Head or Program Chair (Type Name & Sign) Date

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

   Patricia A. Burke
   Dean of College Date 1-29-13

   Submitted to Coordinating Board by:

   Chair, GC or UCC Date

   Effective Date

   Associate Director, Curricular Services

Questions regarding this form should be directed to Sandra Williams at 845-8201 or sandra.williams@tamu.edu.
Course Description

This course is meant to be taken subsequent to introductory economic statistics and undergraduate econometrics. The course focus is on the empirical application of econometric techniques to prediction in economics. Topics such as basic regression, model building and specification, and hypothesis testing will be reviewed, followed by an in depth examination of various modern forecasting techniques with an emphasis on time series econometric analysis.

Prerequisites

ECMT 463; enrolled in the M.S. program in the department of economics; or approval of instructor.

Textbooks (Optional)


Selected additional readings will be made available as needed.

Value and Objectives of the Course

At the end of the course, the student should be able to:

- Use popular spreadsheet and statistical software such as Microsoft Excel and SAS to combine, manipulate and summarize economic data.
- Distinguish between deterministic and stochastic trends in economic time series data.
- Specify, diagnose and estimate econometric models that decompose the trend, seasonal and cyclical components of an economic time series.
- Use the results of both univariate and multivariate econometric models to construct forecasts of economic time series.

Disclaimer: Texas A&M University encourages qualified persons with disabilities to participate in its programs and activities. If you anticipate needing any type of accommodation in this course or have questions about physical access, please tell the instructor as soon as possible.
Class Procedures

The class will be conducted in a lecture/class discussion format. Questions are strongly encouraged.

Attendance Policy

Class attendance is not mandatory. However, you are responsible for material in the assigned readings and lectures. Therefore, attendance is in your best interest. I am also available for questions during the office hours listed above. If you are unable to meet during these hours, see me before or after class to make an appointment. If you must be absent for one of the exams, you should make prior arrangements with me, if at all possible. If you are unable to make prior arrangements, you must contact me within one class period for the absence to be considered excused. If you miss an exam with an excused absence, a make-up quiz will be arranged. Unexcused absences result in a zero on missed exams or assignments. I may require verifiable evidence of a sickness or other calamity that precludes you from attending class. See University regulations website at [http://student-rules.tamu.edu/rule07](http://student-rules.tamu.edu/rule07).

Course Grade

Your grades will be based on the combination of 3 exams, 6 assignments and a project.

60%: Combined for the 3 Exams (20% each)
15%: Combined for the Assignments (roughly one due every two weeks)
25%: Term Project

For most assignments I strongly recommend teamwork. For those assignments where teamwork is allowed, the group may turn in a single copy of the assignment listing all members of the team. For the Term Project, teams will be assigned according to a common interest in a particular company. Maximum team size for assignments is 3. Assignment teams and Term Project teams may be different.

All assignments are due at the BEGINNING of the class on the announced due date.

For the Term Project, the due date is the last day of classes. I will work closely with each project team to help define and focus the forecasting exercise. The final product should be a typed 7-10 page paper discussing the objectives of the forecasting exercise, the econometric analysis undertaken as part of that exercise and how the analyses address the initial objectives of the project. We will use our final exam period for in-class presentations of the Term Project by each team; an 8-10 minute presentation to the class followed by a brief question and answer session.

Grading Scale

<table>
<thead>
<tr>
<th>Percentage</th>
<th>Grade</th>
</tr>
</thead>
<tbody>
<tr>
<td>90 – 100%</td>
<td>A</td>
</tr>
<tr>
<td>80 – 89%</td>
<td>B</td>
</tr>
<tr>
<td>70 – 79%</td>
<td>C</td>
</tr>
<tr>
<td>60 – 69%</td>
<td>D</td>
</tr>
<tr>
<td>&lt; 60%</td>
<td>F</td>
</tr>
</tbody>
</table>

Homework - Computer Assignments
Homework will be assigned approximately every-other week throughout the semester. Most all of the assignments will involve the use of specialized econometric software. Several different software packages, such as E-Views, STATA, GRETl or SAS are available in the 4th floor Economics computer lab. I will primarily use the GRETl software package for demonstrations in class but you are not required to use, nor will you be tested on, a particular software package. A student version of E-Views is available for purchase. The GRETl software is 'shareware' and is available for free downloading from http://gretl.sourceforge.net. In addition to econometric software, we will make considerable use of the Excel spreadsheet program for data manipulation and graphing.

**Americans with Disabilities Act (ADA)**

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 Disabilities Services in Cain Hall Room B118, or call 845-1637. For additional information visit website at: http://disability.tamu.edu

**Academic Integrity**

Academic dishonesty will not be tolerated. Your responsibilities with regard to scholastic dishonesty are described in detail in various Texas A&M University policy statements on scholastic dishonesty. Scholastic dishonesty may result in failure on the examination, project or course. For more information visit website at: http://www.tamu.edu/aggiehonor. You will be expected to acknowledge and adhere to the Aggie Code of Conduct – “An Aggie does not lie, cheat, or steal, or tolerate those who do.”

Note that evidence of group/joint effort on individual class assignments constitutes academic dishonesty and will result in a failing grade for the course.

**Topical Outline:**

Week 1.
   a. Introduction: Why Forecast?
   b. Review of Statistics and Regression

Week 2.
   a. Review of Statistics and Regression (cont.)
   b. Exploring Time Series Data
   c. Forecasting Stationary Time Series Variables

Week 3.
   Forecasting Stationary Time Series Variables (cont.)

Week 4.
   Forecasting Stationary Time Series Variables (cont.)

**Exam 1:** Tentatively Scheduled for Thursday, September 19th
Week 5. Modeling Volatility

Week 6. Non-Stationary Time Series Variables - Unit Roots in Time Series Variables

Week 7. Non-Stationary Time Series Variables - Unit Roots in Time Series Variables (cont.)

Week 8. Multi-equation Time Series Models

Week 9. Multi-equation Time Series Models (cont.)

Exam 2: Tentatively Scheduled for Tuesday, October 24th

Week 10. Cointegration: Tests and Implications

Week 11. Error Correction Models

Week 12. Error Correction Models

Week 13. Forecast Evaluation and Presentation

Week 14. Structural Breaks and Intercept Correction

Exam 3: During Regularly Scheduled Final Exam Period
Texas A&M University
Departmental Request for a New Course
Undergraduate • Graduate • Professional
• Submit original form and attach a course syllabus.

Form Instructions

1. Request submitted by (Department or Program Name): Educational Psychology

2. Course prefix, number and complete title of course: EDTC 641: Educational Game Design

3. Catalog course description (not to exceed 50 words): Formal and dramatic elements of successful non-educational games for principles of effective game design; application principles to the critique of existing educational games; examination commercial games originally designed for entertainment and their use to address educational objectives; games through the lens of multiple theories of learning and motivation, including situated cognition, flow, and systems theory.

4. Prerequisite(s): Graduate Classification; approval of department head

Cross-listed with: Stacked with:

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

5. Is this a variable credit course? □ Yes □ No If yes, from _____ to _____

6. Is this a repeatable course? □ Yes □ No If yes, this course may be taken _____ times.

Will this course be repeated within the same semester? □ Yes □ No

7. This course will be:
   a. required for students enrolled in the following degree programs(s) (e.g., B.A. in history)

   b. an elective for students enrolled in the following degree program(s) (e.g., M.S., Ph.D. in geography)

   Master's program in Educational Technology and the Ph.D. program in Educational Psychology

8. If other departments are teaching or are responsible for related subject matter, the course must be coordinated with these departments. Attach approval letters.

9. Prefix Course # Title (excluding punctuation)

|   | E | D | T | C | 6 | 4 | 1 | E | D | U | C | G | A | M | E | D | E | S | I | G | N |
|   |   |   |   |   | 3 | 1 | 3 | 0 | 1 | 0 | 0 | 0 | 4 | 0 | 9 | 2 | 0 | 1 | 3 | 1 | 4 | 0 | 0 | 3 | 6 | 3 | 2 |

Approval recommended by:

Victor Wilson, Ph.D.
Department Head or Program Chair (Type Name & Sign) Date

George Cunningham, Ph.D.
Chair, College Review Committee Date

Victor Wilson, Ph.D.
Department Head or Program Chair (Type Name & Sign) Date
(if cross-listed course)

George Cunningham, Ph.D.
Dean of College Date

Mark Zoran, Ph.D.
Chair, GC or UCC Date

Submitted to Coordinating Board by:

Associate Director, Curricular Services

Questions regarding this form should be directed to Sandra Williams at 845-8201 or sandra-williams@tamu.edu.
Curricular Services – 3/10
EDTC 641: Educational Game Design

Spring, 2015

Dr. Susan Pedersen
Office: Harrington, Room 643
Email: spedersen@tamu.edu
512-633-2206
Skype: susan-pedersen
Office Hours: by appointment, in office or electronically in Skype or Collaborate

Course Description

Games have long been used in education, but with the rapid uptake of electronic gaming systems in recent years, educators have begun to explore how the motivational potential of games can best be exploited to support learning. In this course, we will examine the formal and dramatic elements of successful non-educational games for principles of effective game design, and then apply these principles to the critique of existing educational games. We will also examine how commercial games originally designed for entertainment can be used to address educational objectives. We will examine games through the lens of multiple theories of learning and motivation, including situated cognition, flow, and systems theory.

Course Objectives

By the time you complete this course, you should be able to

- Explain how the formal and dramatic elements of popular games engage players
- Critique existing educational games for their potential to impact learning and engagement
- Connect learners' experiences in non-educational games to educational objectives
- Develop a pitch for an educational game, using theories of learning and motivation to explain why the game has the potential to impact learning

Meeting Location and Times

This course is held completely online and requires no face-to-face meetings or synchronous online meetings. When working on group projects, some students prefer to set up face-to-face or synchronous meetings; this is fine, but not expected.

Prerequisites
Graduate student standing and Approval of department head. Students are not expected to have instructional design, gaming, or programming experience.

Texts


Assignments

- Blog. You will maintain your own personal blog within Blackboard in which you apply ideas you garner from the readings and class discussion to critique the games that we review in class. You will review others' blogs and post comments on them.
- Game Implementation Plan. You will work with a group to develop a plan for how to use a commercial game in a classroom setting to address an educational objective, and then develop the support materials necessary to use the game effectively.
- Game Pitch. You will work with a group to develop a pitch for an original educational game.
- Final Project: You will propose a final project designed to advance your understanding of educational games. Projects must be approved by the instructor prior to starting them. Examples of possible projects include
  - Playtest an existing educational game with target users and report on the results. This may involve creating supplemental materials or measures that you test and revise through multiple cycles. Or it could result in a report for the developers with suggestions for revisions to the game.
  - Design and develop a digital prototype for an original educational game using a simple program like GameMaker or Scratch; test the game with a small number of target players.

Grading Policies

- Late work: All work must be turned in on time. Assignments involving group work cannot be made up if missed except in instances of excused University absence. A grade of incomplete will only be given for certifiable medical reasons or under extraordinary circumstances discussed with the instructor. Please review the University attendance policy here: [http://student-rules.tamu.edu/rule07](http://student-rules.tamu.edu/rule07)
- Attendance: This class is conducted asynchronously. If you are working with a group that sets up a time to meet synchronously, you are expected to notify the group if you will be absent at least 12 hours in advance, unless the absence is due to an emergency situation or is a University excused absence.
- Submission of products for multiple classes: Since the course objectives focus on the processes of developing course related materials, as well as the materials themselves, it is expected that all course products will consist of work done specifically for this course. Products completed for previous or concurrent course credit cannot be used for
assignments for this course. If you wish to continue a theme or content area used in another course, inform the instructor and supply any requested existing materials at the start of this course. Any intended projects relating to other courses should be approved at the start by all instructors and should reflect unique elements and sufficient development effort for all courses involved.

- Originality: the guiding principle of academic integrity is that a student's submitted work must be his/her own. Submitting materials developed by someone else, or merely recreating those materials, is an act of plagiarism. As commonly defined, plagiarism consists of passing off as one's own the ideas, words, writings, etc., which belong to another. In accordance with this definition, you are committing plagiarism if you copy the work of another person and turn it in as your own, even if you should have the permission of that person.

**Grading**

Blog: 50 points  
Game Implementation Plan: 15 points  
Game Pitch: 10 points  
Final Project: 25 points  
Total: 100 points

A = 90 to 100 points  
B = 80 to 89 points  
C = 70 to 79 points  
F = 0 to 69 points

**The Americans with Disabilities Act**

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](http://disability.tamu.edu).

**Academic Integrity Statement and Policy reminder**

"An Aggie does not lie, cheat or steal, or tolerate those who do."

For all assignments for this class, you must agree with this statement: “On my honor, as an Aggie, I have neither given nor received unauthorized aid on this academic work.”

Please refer to the [Honor Council Rules and Procedures](http://aggiehonor.tamu.edu/) for further information on Academic Integrity.

Please visit [http://aggiehonor.tamu.edu/](http://aggiehonor.tamu.edu/) for more information
CEHD Statement on Diversity

We, the faculty of the College of Education and Human Development, value and respect diversity and the uniqueness of each individual. The faculty affirms its dedication to non-discrimination in our teaching, programs, and services on the basis of race, color, religion, gender, age, sexual orientation, domestic partner status, ethnic or national origin, veteran status, or disability. The College of Education and Human Development at Texas A&M University is an open and affirming organization that does not tolerate discrimination, vandalism, violence, or hate crimes, and we insist that appropriate action be taken against those who perpetrate such acts. Further, the College is committed to protecting the welfare, rights, and privileges of anyone who is a target of prejudice or bigotry. Our commitment to tolerance, respect, and action to promote and enforce these values embraces the entire university community.

Schedule of Classes

<table>
<thead>
<tr>
<th>Week Number</th>
<th>Start Date</th>
<th>Tentative Topics and Major Assignment Due Dates</th>
<th>Games</th>
<th>Readings</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td></td>
<td>Do Games Belong in Education?</td>
<td></td>
<td></td>
</tr>
<tr>
<td>2</td>
<td></td>
<td>Formal Elements of Games and Games as Systems</td>
<td></td>
<td>Fullerton Ch. 1 - 3</td>
</tr>
<tr>
<td>3</td>
<td></td>
<td>Gagne's Nine Events</td>
<td></td>
<td>Fullerton Ch. 4 - 5</td>
</tr>
<tr>
<td>4</td>
<td></td>
<td>But is it Fun?</td>
<td></td>
<td>Squire 1 and 6</td>
</tr>
<tr>
<td>5</td>
<td></td>
<td>Game Implementation Project</td>
<td></td>
<td>Squire Ch. 2, 3, and 7</td>
</tr>
<tr>
<td>6</td>
<td></td>
<td>Game Implementation Plan due</td>
<td></td>
<td></td>
</tr>
<tr>
<td>7</td>
<td></td>
<td>Games for the Very Young and the Not So</td>
<td></td>
<td></td>
</tr>
<tr>
<td>8</td>
<td></td>
<td>Game Development</td>
<td>Gamestar Mechanic</td>
<td>Fullerton Ch. 6 &amp; 7</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Game Pitch Project</td>
<td></td>
<td></td>
</tr>
<tr>
<td>9</td>
<td></td>
<td></td>
<td></td>
<td>Fullerton Ch. 16 Squire Ch. 5</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Game Pitch Project due</td>
<td></td>
<td></td>
</tr>
<tr>
<td>10</td>
<td></td>
<td>Proposal for final project due</td>
<td></td>
<td>Fullerton Ch. 8 &amp; 9</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>11</td>
<td></td>
<td>Games and Assessment</td>
<td>WolfQuest</td>
<td>Fullerton Ch. 10 &amp; 11</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>(<a href="http://www.wolfquest.org/">http://www.wolfquest.org/</a>)</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Rigglefish</td>
<td></td>
</tr>
<tr>
<td>12</td>
<td></td>
<td>Games for Social Impact</td>
<td></td>
<td>Squire Ch. 10</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Final Project</td>
<td></td>
<td></td>
</tr>
<tr>
<td>13</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>14</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
Texas A&M University
Departmental Request for a New Course
Undergraduate • Graduate • Professional
• Submit original form and attach a course syllabus.

1. Request submitted by (Department or Program Name):
   Physics and Astronomy

2. Course prefix, number and complete title of course:
   PHYS 841 Extragalactic Astronomy

3. Catalog course description (not to exceed 50 words):
   Overview of observations of galaxies and large-scale structures in the Universe to understand their formation and evolution from theoretical and observational perspectives. Galaxy luminosity functions; evolution of stellar populations and chemical enrichment; clusters and AGN.

4. Prerequisite(s):
   PHYS 801; or ASTR 314 and PHYS 302; or permission of instructor

5. Is this a variable credit course? □ Yes ☑ No
   If yes, from _____ to _____

6. Is this a repeatable course? □ Yes ☑ No
   If yes, this course may be taken _____ times.
   Will this course be repeated within the same semester? □ Yes ☑ No

7. This course will be:
   a. required for students enrolled in the following degree program(s) (e.g., B.A. in history)
   b. an elective for students enrolled in the following degree program(s) (e.g., M.S., Ph.D. in geography)
   MS or PhD in physics

8. If other departments are teaching or are responsible for related subject matter, the course must be coordinated with these departments. Attach approval letters.

9. Prefix  Course #  Title (excluding punctuation)
   PHYS  641  EXTRAGALACTIC ASTRONOMY

   Lect  Lab  SCH  CP  and Fund Code  Admin. Unit  Acad. Year  HCE Code
   0  3  0  0  3  4  0  2  0  2  0  1  0  0  2  3  0  4  1  3 - 1  4  0  0  3  6  3  2

   Approval recommended by:

   George R. Welch
   Department Head or Program Chair (Type Name & Sign) Date 11-28-2012

   Chair, College Review Committee
   Date 12-10-12

   George R. Welch
   Department Head or Program Chair (Type Name & Sign) Date 11-28-2012
   (if cross-listed course)

   Dean of College
   Date 1-9-13

   Submitted to Coordinating Board by:

   Chair, GC or UCC
   Date

   Questions regarding this form should be directed to Sandra Williams at 845-8201 or sandra.williams@tamu.edu.
   Curricular Services – 3/10
PHYS 641 : Extragalactic Astronomy

Instructor      Dr. Casey Papovich, Associate Professor of Physics
Office: Mitchell 325
Phone: 979-862-2704
Webpage: http://faculty.physics.tamu.edu/papovich/
Email: papovich@physics.tamu.edu
Office Hours: Tues, Thurs 8:30 - 9:30 am and by appointment

Class           Times: Tues, Thurs, 9:35 - 10:50 am
                Location: MPHYS 109
                Webpage: http://faculty.physics.tamu.edu/papovich/courses/fall12/

Textbook       Extragalactic Astronomy and Cosmology
                by Peter Schneider. ISBN: 978-3540331742

This course provides an overview of observations of galaxies in the Universe. The goal of this
course is to provide an advanced understanding of the formation and evolution of galaxies and
large-scale structures in the Universe both from a theoretical and observational perspective.
Specific topics will include the formation of structure in the early Universe, the distribution
of galaxy properties, galaxy number counts and luminosity functions. The course will discuss the
evolution of stellar populations and chemical enrichment in galaxies. Other topics include
galaxy groups, galaxy clusters, and the effects of these dense environments on galaxy
evolution. The course will also include an overview of active galaxies (radio galaxies, quasars,
other AGN) and their relationship to galaxies.

Grading Policy  Your final grade will be a combination of the grades from the final exam
                (20%), three homework projects (3 x 20% = 60%), and attendance and
                in-class participation (20%).

Prerequisites    PHYS 601, or ASTR 314 and PHYS 302, or permission of instructor

Absences        Attendance and in-class participation account for 10% of your grade.
                Only officially excused absences as outlined by the University
                Regulations will be accepted, see:
                http://student-rules.tamu.edu/rule07
                If you know you will be absent, please contact the instructor as soon as
                possible.
ASTR 601 : Extragalactic Astronomy  
Fall 2012

Homework Projects and Final Exam
The majority of your grade will be based on homework assignments, due about every 4 weeks. These will be handed out in class and due 2 weeks later. All assignments must be submitted as PDF documents made using LATEX. You must email your PDF document to the professor by 11:59 pm on the due date.

I recommend using the AASTEX template provided by the AAS.  
http://aastex.aas.org

Documentation is available here:  
http://aastex.aas.org/docs.html

I also recommend you obtain one or both of the following books:  
LATEX: A documentation Preparation System, by Leslie Lamport.  
2nd edition.  
The LATEX Companion (Tools and Techniques for Computer Typesetting)

ADA Policy
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 the Department of Student Life, Services for Students with Disabilities, in Room 126 of the Koldus Building or call 845-1637.

Honor Code
I consider it a privilege to work with students of such character as that of Aggies. The honor code sets Texas A&M apart from other universities, see http://www.tamu.edu/aggiehonor, and you should be proud of the standard this sets. I expect that you will uphold the Aggie principle, “An Aggie does not lie, cheat, or steal or tolerate those who do.” On all quizzes, exams and the essay you should abide by the Aggie code of conduct, “On my honor as an Aggie, I have neither given nor received unauthorized aid on this academic work.” For homework, I encourage you to talk to other students and to help each other as you will all learn better this way. However, the work you turn in should be your own, never copied from another student.

v2012 Sep 13
<table>
<thead>
<tr>
<th>Lecture</th>
<th>Tentative Syllabus (subject to change)</th>
<th>Assignment(s)</th>
<th>Due Date</th>
</tr>
</thead>
<tbody>
<tr>
<td>Week 1</td>
<td>Preliminaries. Radiation, Magnitudes, Stars, Stellar Populations</td>
<td>Schneider Appendixes</td>
<td>8/30</td>
</tr>
<tr>
<td></td>
<td><strong>Homework Assignment #1 Due</strong></td>
<td></td>
<td>9/21</td>
</tr>
<tr>
<td></td>
<td><strong>Homework Assignment #2 Due</strong></td>
<td></td>
<td>10/19</td>
</tr>
<tr>
<td></td>
<td><strong>Homework Assignment #3 Due</strong></td>
<td></td>
<td>11/16</td>
</tr>
<tr>
<td></td>
<td><strong>Final due</strong></td>
<td></td>
<td>12/7</td>
</tr>
</tbody>
</table>

v2012 Sep 13
Texas A&M University
Departmental Request for a New Course
Undergraduate • Graduate • Professional
• Submit original form and attach a course syllabus.

1. Request submitted by (Department or Program Name): Physics and Astronomy
2. Course prefix, number and complete title of course: PHYS 642 Astronomical Observing Techniques and Instrumentation

3. Catalog course description (not to exceed 50 words):
   Theory and practice of obtaining and analyzing astrometric, photometric, spectroscopic, and interferometric measurements of astronomical sources across the electromagnetic spectrum. Principles of design, fabrication, assembly, test, deployment, and use of astronomical instruments.

4. Prerequisite(s):
   PHYS 815 or equivalent; or permission of instructor

5. Is this a variable credit course? Yes □ No □
   If yes, from _______ to _______

6. Is this a repeatable course? Yes □ No □
   If yes, this course may be taken _______ times.
   Will this course be repeated within the same semester? Yes □ No □

7. This course will be:
   a. required for students enrolled in the following degree programs(s) (e.g., B.A. in history)

   b. an elective for students enrolled in the following degree program(s) (e.g., M.S., Ph.D. in geography)
      MS or PhD in physics

8. If other departments are teaching or are responsible for related subject matter, the course must be coordinated with these departments. Attach approval letters.

9. Prefix Course# Title (excluding punctuation):
   PHYS 642 ASTR OBSV TECH & INSTR
   Lect Lab SCH CP and Fund Code Admin Unit Acad Year HIC Code
   0 3 0 0 0 3 4 0 0 2 0 2 0 1 0 0 2 3 0 4 1 3 - 1 4 0 0 3 6 3 2

   Approval recommended by:
   George R. Welch
   Department Head or Program Chair (Type Name & Sign) Date Chair, College Review Committee Date
   11.28.2012 1-9-12
   Dean of College Date
   11.28.2012
   (if cross-listed course)

   Submitted to Coordinating Board by:
   Chair, GC or UCC Date

   Effective Date

Questions regarding this form should be directed to Sandra Williams at 845-8201 or sandra.williams@tamu.edu.
Curricular Services – 3/10
Physics 642: Astronomical Observing Techniques and Instrumentation

Purpose
This course provides an opportunity for the students to acquaint themselves with the basic techniques of how to obtain meaningful astronomical data and the principles of astronomical instrumentation. It will introduce analysis tools (IRAF, IDL, AIPS, etc.) and statistical techniques (correlation, regression, \( \chi^2 \), non-parametric) that are commonly used in astronomical research. Course participants will also learn to use a telescope and modern astronomical detector systems in a night-time research setting.

Course Description
This course covers the theory and practice of obtaining astronomical data. Specific topics include the astrometric, photometric, spectroscopic, and interferometric measurement of astronomical sources across the electromagnetic spectrum. There is an introduction to statistical analysis of astronomical data that includes signal detection, signal-to-noise estimates, model fitting, good-of-fit estimation, and non-parametric techniques. There is discussion of the techniques and practices of the design, fabrication, assembly, test, deployment, and use of modern astronomical instruments.

Instructor
Prof. Darren Depoy, Mitchell Institute for Fundamental Physics & Astronomy 420

Course Materials
Course handouts and notes will also be available.

Course Grade
The course grade will be assigned on the basis of exam performance (33%), assigned homework (33%), and an oral presentation describing some astronomical instrumentation system (33%).

Exams
There will be two in-class exams (mid-term and final) over material presented in the course lectures. Each will contain short-answer and essay questions that will require calculation and quantitative estimates.

Homework
There will be homework problems assigned throughout the semester. Each problem will require the student to investigate an aspect of instrument design (throughput, resolution, bandpass, etc.).

Presentation
Each student will prepare a written report and give an oral presentation on an existing or planned astronomical instrument (telescope, satellite, etc.).
ADA Policy
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 special accommodation, please contact the Department of Student Life, Services for Students with Disabilities, in Room 126 of the Koldus Building or call 845-1637.

Honor Code
Texas A&M University assumes that all students enroll in its programs with a serious learning purpose and expects them to be responsible individuals who demand of themselves high standards of honesty and personal conduct. All students are expected to behave at all times with respect and courtesy toward their fellow students and instructors and are to have the highest standards of honesty and integrity in their academic performance. Any behavior which disrupts the classroom learning environment or any attempt to present work that the student has not actually prepared as their own work, or to pass an examination by improper means, is regarded as a serious offense. The minimum penalty for such an offense is a failing grade for this course. Aiding and abetting the above behavior is also considered a serious offense resulting in equally severe penalties.

I consider it a privilege to work with students of such character as that of Aggies. The Honor Code sets Texas A&M apart from other universities, and you should be proud of the standard this sets. I expect that you will abide by the Aggie Code of Honor:

The Aggie Honor Code: An Aggie does not lie, cheat or steal, or tolerate those who do

Further information regarding the Honor Council Rules and Procedures may be found on the web at http://www.tamu.edu/aggiehonor

Course Outline

Weeks 1-2: Introduction and Positional Astronomy (coordinate systems, spherical geometry, precession, time, right ascension and declination). Detection of a signal (signal-to-noise ratio). Statistics (sample and parent population, mean and variance, Poisson and Gaussian distributions, regression, correlation, χ², etc.)

Weeks 3-4: Non-parametric statistics: non-Gaussian distribution functions (exponential, Cauchy, beta, Student’s t, Pareto) and appropriate applications, mean and variance, non-parametric tests (Pearson’s χ², Kolmogorov-Smirnov, von Mises, Anderson-Darling, Mann-Whitney U, Spearman’s Rank, Kendall’s τ, etc.) and appropriate application. Multivariate analysis (principal component, discriminant, clustering, etc.). Time series analysis. Bayes’ theorem and examples. Fisher matrices and joint probability.

Weeks 5-6: Photon detectors (semiconductors, photodiodes, CCDs, infrared arrays, bolometers, heterodyne mixing, antenna theory). Instrumental signatures and noise sources (dark current, Johnson
noise, electronic noise sources, pixel-to-pixel variations in quantum efficiency, etc.). Image analysis and data processing (IRAF, IDL, etc.). Signal-to-noise estimates and predictions.

Weeks 7-8: Optics (geometric optics, telescope design, aberrations, physical optics, elementary optical design). Atmospheric effects (refraction, seeing, observatory sites and selection criteria, extinction and emission, adaptive optics). Practical considerations in instrumentation design (finite element and flexure analysis, cryogenic systems and cooling design, scattered and stray light analysis and control, calibration unit design, etc.)

Weeks 9-11: Photometry (photometric and radiometric concepts, magnitudes, photometric systems, absolute calibration, signal-to-noise calculation, etc.). Definition and design of filters. Photometry from a photographic plate. Design of a photometer (photomultiplier tubes, field lens, stops, readout electronics). Design of an imaging system (CCDs, optics, structural analysis, cryogenics, etc.).

Weeks 12-14: Spectroscopy: design of a slit spectrometer, dispersers (prisms, gratings, grisms, volume-phase holographic gratings), and other practical considerations. Analysis of spectroscopic data and removal of instrumental effects. Spectroscopy in the infrared. Other assorted spectroscopic techniques (Fourier transform spectroscopy, heterodyne techniques, Fabry-Perot interference, etc.). Design considerations for multi-object spectrographs (fibers, slit masks, etc.). Signal-to-noise calculations.

Week 15: Special topics: Radio, sub-mm, and x-ray astronomy; space astronomy and satellite design, etc. Neutrino and Gravitational Wave astronomy.
Texas A&M University
Departmental Request for a New Course
Undergraduate • Graduate • Professional
• Submit original form and attach a course syllabus.

1. Request submitted by *(Department or Program Name)*: Physics and Astronomy

2. Course prefix, number and complete title of course: PHY 643 Stellar Astrophysics

3. Catalog course description (not to exceed 50 words):
Theoretical and observational aspects of stellar astrophysics. Thermodynamic properties of stellar interiors; energy sources; nuclear processes and burning stages; convective and radiative energy transport; evolutionary models; atmospheres; stability and pulsations; chemical enrichment processes; population synthesis.

4. Prerequisite(s):
PHYS 606 and PHYS 607 or equivalents; or permission of instructor

5. Is this a variable credit course? Yes ☐ No ☑ If yes, from _____ to _____

6. Is this a repeatable course? Yes ☐ No ☑ If yes, this course may be taken _____ times.

7. Will this course be repeated within the same semester? Yes ☐ No ☑

8. This course will be:
a. required for students enrolled in the following degree programs(s) *(e.g., B.A. in history)*

b. an elective for students enrolled in the following degree program(s) *(e.g., M.S., Ph.D. in geography)*

MS or PhD in physics

9. Approval recommended by:

George R. Welch
Department Head or Program Chair *(Type Name & Sign)*
Date 11.20.2012

Chair, College Review Committee *(Type Name & Sign)*
Date 12.10.12

George R. Welch
Department Head or Program Chair *(Type Name & Sign)*
Date 11.20.2012

Dean of College *(Type Name & Sign)*
Date 1-9-13

Submitted to Coordinating Board by:

Associate Director, Curricular Services

Questions regarding this form should be directed to Sandra Williams at 845-8201 or sandra.williams@tamu.edu.
Physics 643: Stellar Astrophysics

Purpose
This course will give the students a thorough introduction to stellar astrophysics at a graduate level. It will cover the physical processes that take place in all layers of a star, from the core to the atmosphere. It will explore the temporal evolution of stars, from protostellar cores to core burning and beyond. It will discuss the stability of stellar atmospheres and pulsation mechanisms.

Course Description
This course covers the theoretical and observational aspects of stellar astrophysics. Specific topics include: thermodynamic properties of stellar interiors, energy sources, nuclear processes and burning stages, convective and radiative energy transport, evolutionary models, atmospheres, stability and pulsations, chemical enrichment processes and population synthesis.

Course Materials
Course handouts and notes will also be available.

Course Grade
The course grade will be assigned on the basis of exam performance (40%), assigned homework (30%), an oral presentation (15%) and in-class participation in the discussion of papers.

Exams
There will be two take-home exams (mid-term and final) over material presented in the course lectures. Each will contain questions that will require calculation and quantitative estimates.

Homework
There will be six homework problems assigned throughout the semester. Some problems will require the students to write computer programs to simulate astrophysical process associated with stars.

Presentation
Each student will prepare a 20-minute presentation on one of the topics covered during the course. These presentations will take place at the end of the semester.

ADA Policy
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 special accommodation, please contact the Department of Student Life, Services for Students with Disabilities, in Room 126 of the Koldus Building or call 845-1637.
Honor Code
Texas A&M University assumes that all students enroll in its programs with a serious learning purpose and expects them to be responsible individuals who demand of themselves high standards of honesty and personal conduct. All students are expected to behave at all times with respect and courtesy toward their fellow students and instructors and are to have the highest standards of honesty and integrity in their academic performance. Any behavior which disrupts the classroom learning environment or any attempt to present work that the student has not actually prepared as their own work, or to pass an examination by improper means, is regarded as a serious offense. The minimum penalty for such an offense is a failing grade for this course. Aiding and abetting the above behavior is also considered a serious offense resulting in equally severe penalties.

I consider it a privilege to work with students of such character as that of Aggies. The Honor Code sets Texas A&M apart from other universities, and you should be proud of the standard this sets. I expect that you will abide by the Aggie Code of Honor:

The Aggie Honor Code: An Aggie does not lie, cheat or steal, or tolerate those who do

Further information regarding the Honor Council Rules and Procedures may be found on the web at http://www.tamu.edu/aggiehonor

Course Outline

Weeks 1-3:

Weeks 4-6:
Star formation and YSOs. Main sequence stars. Late stages of evolution. Binary systems. Thermodynamic properties: ideal gas with radiation; ionized real gas; the Saha equation. Degenerate matter; equation of state.

Weeks 7-9:

Weeks 10-12:

Weeks 13-14: Student presentations. Review for final exam.
Texas A&M University
Departmental Request for a New Course
Undergraduate • Graduate • Professional
* Submit original form and attach a course syllabus.*

1. Request submitted by (Department or Program Name): Physics and Astronomy
2. Course prefix, number and complete title of course: PHYS 644 Cosmology
3. Catalog course description (not to exceed 50 words):
   Basic principles of modern cosmology and particle physics. General relativity; cosmic inflation; Big Bang nucleosynthesis; expansion of the universe; cosmic microwave background; large-scale structure of the Universe; properties of particles; dark matter; dark energy.

4. Prerequisite(s):
   PHYS 615 or equivalent; or permission of instructor

5. Is this a variable credit course? Yes □ No □ If yes, from _____ to _____
6. Is this a repeatable course? Yes □ No □ If yes, this course may be taken _____ times.
   Will this course be repeated within the same semester? Yes □ No □

7. This course will be:
   a. required for students enrolled in the following degree programs(s) (e.g., B.A. in history)
   b. an elective for students enrolled in the following degree program(s) (e.g., M.S., Ph.D. in geography)

8. MS or PhD in physics

9. If other departments are teaching or are responsible for related subject matter, the course must be coordinated with these departments. Attach approval letters.

<table>
<thead>
<tr>
<th>Name of Course</th>
<th>Title (excluding punctuation)</th>
</tr>
</thead>
<tbody>
<tr>
<td>PHYS 644</td>
<td>Cosmology</td>
</tr>
</tbody>
</table>

Lect. Lab SCH CP and Fund Code Admin. Unit Acad. Year ECE Code
0 3 0 0 0 3 4 0 2 0 2 0 1 0 0 2 3 0 4 1 2 - 1 4 0 0 3 6 3 2

Approval recommended by:
George R. Welch
Department Head or Program Chair (Type Name & Sign) Date
11.28.2012
Chair, College Review Committee Date
12-10-12
George R. Welch
Department Head or Program Chair (Type Name & Sign) (if cross-listed course)
11.28.2012
Dean of College Date
1-9-12

Submitted to Coordinating Board by:
Chair, GC or UCC Date

Associate Director, Curricular Services

Questions regarding this form should be directed to Sandra Williams at 845 8201 or sandra-williams@tamu.edu
Curricular Services – 3/10
PHYS 644
PARTICLE PHYSICS AND COSMOLOGY

Instructor

Prof. Bhaskar Dutta, Texas A&M
Email: dutta@physics.tamu.edu
Phone/e-mail: 845-5359, dutta@physics.tamu.edu
Office Hours: Monday, Wednesday: 1:00-2:00 PM or by appointment

COURSE OBJECTIVES

This course will provide the basic principles of modern cosmology and particle physics, as well as their connections. This course will cover the expansion of the universe; the cosmic microwave background (CMB); the large-scale structure of the Universe; properties of particles; dark matter; Big Bang nucleosynthesis (BBN); and cosmic inflation.

TEXTBOOK: No required text book – lecture notes will be provided.

CLASS

- Class will meet at on MW 10:10–11:25am.

HOMEWORK

- There will be 4 homework assignments. These will be written assignments and reports (see the course schedule for topics). There will be exams.

GRADING

- The course grade will be evaluated on the basis of:
  100% homework (4 homework assignments)

- The following grading scale will be used: 80+=A; 70-79=B; 60-69=C; 50-59=D. Any average below 50 is failing.
Americans with Disabilities Act (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 the Department of Student Life, Services for Students with Disabilities, in Room 126 of the Koldus Building or call 845-1637

Academic Integrity Statement

"An Aggie does not lie, cheat, or steal or tolerate those who do"
All work in this course will be held to the standard described in the Aggie Honor code. For further details please see the Honor Council Rules and Procedures on the web http://www.tamu.edu/aggiehonor}
Texas A&M University
Departmental Request for a New Course
Undergraduate • Graduate • Professional
Submit original form and attach a course syllabus.

1. Request submitted by (Department or Program Name): Physics and Astronomy
2. Course prefix, number and complete title of course: PHYS 645 Galactic Astronomy

3. Catalog course description (not to exceed 50 words):
Basic nature and structure of constituents of Milky Way galaxy. Distribution and motions of stars and gas; origin, evolution and distribution of large-scale chemical abundances and kinematic patterns across populations; models of galaxy formation and implications of modern observations.

4. Prerequisite(s):
   ASTR 605
   Cross-listed with: Stacked with:

5. Is this a variable credit course? Yes No
   If yes, from ______ to ______

6. Is this a repeatable course? Yes No
   If yes, this course may be taken ______ times.
   Will this course be repeated within the same semester? Yes No

7. This course will be:
   a. required for students enrolled in the following degree program(s) (e.g., B.A. in history)
   b. an elective for students enrolled in the following degree program(s) (e.g., M.S., Ph.D. in geography)

MS or PhD in physics

8. If other departments are teaching or are responsible for related subject matter, the course must be coordinated with these departments. Attach approval letters.

9. Prefix Course # Title (excluding punctuation)
   PHYS 645 GALACTIC ASTRONOMY
   Lect. Lab SCH CRIP and Field Code
   0 3 0 0 0 3 4 0 0 2 0 2 0 1 0 0 2 3 0 4 1 3 - 1 4 0 0 3 6 3 2

   Approval recommended by:
   George R. Welch
   Department Head or Program Chair (Type Name & Sign) Date 11-26-2012
   Chair, College Review Committee Date 11-26-2012
   Dean of College Date 11-26-2012

   Submitted to Coordinating Board by:
   George R. Welch
   Department Head or Program Chair (Type Name & Sign) Date 11-26-2012
   Chair, GC or UCC Date
   Effective Date

Questions regarding this form should be directed to Sandra Williams at 845-8201 or sandra.williams@tamu.edu.
Curricular Services – 3/10
Physics 645: Galactic Astronomy

Purpose
This course gives the students an opportunity to discuss the basic nature and structure of the constituents of our Milky Way galaxy. The distribution and motions of stars and gas in the Milky Way will be described and the implications for the formation of the Galaxy discussed. The large-scale distribution of chemical abundances and the patterns seen in different kinematic populations will also be presented; the original and evolution of the observed chemical abundance patterns will also be investigated. Various models of galaxy formation will also be discussed and the implications of modern observations presented.

Instructor
Prof. Nicholas Suntzeff, Mitchell Institute M513, 458-1786, nsuntzeff@tamu.edu

Course Description
An overview of the content and structure of our Milky Way Galaxy. The course will discuss the physical properties of stars and gas constituents of the Galaxy, the space distribution of stars and chemical elements, large-scale structure and kinematics, and formation scenarios. Comparison of formation models to modern observational results will also be included.

Course Materials
Course handouts and notes will also be available.

Course Grade
The course grade will be assigned on the basis of exam performance (25%), assigned homework (50%), and an oral presentation on a topic covered by the course (25%).

Exams
There will be one final exam over material presented in the course lectures. The exam will contain short-answer and essay questions that will require calculation and quantitative estimates.

Homework
There will be homework problems assigned throughout the semester.

Presentation
Each student will prepare a 30-minute presentation on a topic related to current research on Galactic astronomy.

ADA Policy
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 special accommodation, please contact the Department of Student Life, Services for Students with Disabilities, in Room 126 of the Koldus Building or call 845-1637.
Honor Code
Texas A&M University assumes that all students enroll in its programs with a serious learning purpose and expects them to be responsible individuals who demand of themselves high standards of honesty and personal conduct. All students are expected to behave at all times with respect and courtesy toward their fellow students and instructors and are to have the highest standards of honesty and integrity in their academic performance. Any behavior which disrupts the classroom learning environment or any attempt to present work that the student has not actually prepared as their own work, or to pass an examination by improper means, is regarded as a serious offense. The minimum penalty for such an offense is a failing grade for this course. Aiding and abetting the above behavior is also considered a serious offense resulting in equally severe penalties.

I consider it a privilege to work with students of such character as that of Aggies. The Honor Code sets Texas A&M apart from other universities, and you should be proud of the standard this sets. I expect that you will abide by the Aggie Code of Honor:

The Aggie Honor Code: An Aggie does not lie, cheat or steal, or tolerate those who do

Further information regarding the Honor Council Rules and Procedures may be found on the web at http://www.tamu.edu/aggiehonor

Course Outline

Weeks 1-2: Overview of the Milky Way. The historical growth of our conception of our Galaxy.

Weeks 3-4: Measurements of stars that help us understand the nature of the Milky Way: positions and coordinate systems, proper motions, parallax, radial velocities, stellar spectra, magnitudes and colors, absolute energy distributions, and a survey of astronomical catalogues and atlases.

Weeks 5-6: The physical properties of stars and the gaseous constituents of the Milky Way: stellar distances, masses and radii, analysis of stellar spectra, the systematic differences between stellar populations (spiral arms and disk populations versus halo populations), and interstellar absorption.

Weeks 7-9: The space distribution of stars and chemical elements in the Milky Way: the apparent distribution of stars, star-count analysis, the distribution of stars and the chemical elements, and the difference between stellar populations.

Weeks 10-12: Stellar kinematics: the motion of the Sun in the Milky Way, motions of disk stars, motions of halo stars, rotation kinematics of the Milky Way and other galaxies, dark matter halos.

Weeks 13-14: The large-scale distribution of gas in the Milky Way and other galaxies: neutral hydrogen, molecular clouds, the Galactic Center, mass in-fall due to collisions.

Week 15: Models of the formation of the Milky Way and other galaxies: classic monolithic collapse, hierarchical formation and accretion, observational evidence for either scenario.
Texas A&M University
Departmental Request for a New Course
Undergraduate • Graduate • Professional
Submit original form and attach a course syllabus.

1. Request submitted by (Department or Program Name): Physics and Astronomy

2. Course prefix, number and complete title of course: PHYS 646 Radiative Transfer

3. Catalog course description (not to exceed 50 words):
Fundamental radiative processes in stellar and planetary atmospheres. Radiation fields; Stokes parameters; Mueller matrix formalism; radiation from moving charges; Compton scattering; plasma effects; atomic structure and radiative transitions; molecular structure and spectra; multiple scattering.

4. Prerequisite(s):
PHYS 302, PHYS 304, PHYS 408, and PHYS 412 or equivalents; or permission of instructor

5. Is this a variable credit course? □ Yes □ No
If yes, from _______ to _______

6. Is this a repeatable course? □ Yes □ No
If yes, this course may be taken ______ times.

7. This course will be:
   a. required for students enrolled in the following degree programs(s) (e.g., B.A. in history)
   b. an elective for students enrolled in the following degree program(s) (e.g., M.S., Ph.D. in geography)

8. If other departments are teaching or are responsible for related subject matter, the course must be coordinated with these departments. Attach approval letters.

9. Prefix Course #: Title (excluding punctuation): PHYS 646 Radiative Processes

   Lect. Lab. SCH. CIP and Fund Code Admin. Unit. Acad. Year. HCL Code
   0 3 0 0 0 3 4 0 0 2 0 2 0 1 0 0 2 3 0 4 1 3 1 4 0 0 3 6 3 2

   Approval recommended by:

   George R. Welch
   Department Head or Program Chair (Type Name & Sigh) Date 10-6-2012

   Chair, College Review Committee Date 12-10-12

   George R. Welch
   Department Head or Program Chair (Type Name & Sigh) Date 11-28-2012

   Dean of College Date 1-9-12

   Submitted to Coordinating Board by:

   Associate Director, Curricular Services Date

   Chair, GC or UCC Effective Date

Questions regarding this form should be directed to Sandra Williams at 845-8201 or sandra-williams@tamu.edu.
Curricular Services – 3/10
PHYS 646: Radiative Processes in Stellar and Planetary Atmospheres
Department of Physics and Astronomy

Instructor
George Kattawar
MPHY 555
kattawar@physics.tamu.edu
979.845.1180

Prerequisites: Undergraduate courses in electricity and magnetism, quantum mechanics, statistical mechanics-thermodynamics, and classical mechanics

Texts: Rybicki and Lightman, Radiative Processes in Astrophysics
Bohren and Clothiaux, Fundamentals of Atmospheric Radiation

Course Description: This course will emphasize the physics involved in the fundamental radiative processes that occur in both stellar and planetary atmospheres. It is designed for both seniors with a good background in upper level physics courses such as electromagnetic theory, statistical mechanics-thermodynamics, and quantum mechanics, and graduate students.

Grading: midterm exam 30%
final exam 30%
homework 20%
special assignments 20%

General topics to be covered
• Fundamentals of radiative transfer
• Radiation fields including Stokes parameters and Mueller matrix formalism
• Radiation from moving charges
• Bremsstrahlung and synchrotron radiation
• Compton scattering
• Plasma effects
• Atomic structure and radiative transitions
• Molecular structure and spectra
• Elementary and advanced multiple scattering
Americans with Disabilities Act (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 the Department of Student Life, Services for Students with Disabilities, in Room B118 of Cain Hall, 979-845-1637.

Academic Integrity Statement
   "An Aggie does not lie, cheat, or steal or tolerate those who do."
The Honor Council Rules and Procedures on the web http://www.tamu.edu/aggiehonor
Course Changes
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 606 Quantum Mechanics

3. Change requested
   a. Prerequisite(s): From: ____________________________ To: ____________________________
   b. Withdrawal (reason): ____________________________
   c. Cross-list with: ____________________________
      Cross-listed courses require the signature of both department chairs.
   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:

<table>
<thead>
<tr>
<th>Prefix</th>
<th>Course #</th>
<th>Title (excluding punctuation)</th>
</tr>
</thead>
<tbody>
<tr>
<td>PHYS</td>
<td>606</td>
<td>QUANTUM MECHANICS</td>
</tr>
<tr>
<td>Lect.</td>
<td>Lab</td>
<td>SCH</td>
</tr>
<tr>
<td>04000</td>
<td>040080100022300003632</td>
<td></td>
</tr>
</tbody>
</table>

   b. Change to:

<table>
<thead>
<tr>
<th>Prefix</th>
<th>Course #</th>
<th>Title (excluding punctuation)</th>
</tr>
</thead>
<tbody>
<tr>
<td>PHYS</td>
<td>606</td>
<td>QUANTUM MECHANICS</td>
</tr>
<tr>
<td>Lect.</td>
<td>Lab</td>
<td>SCH</td>
</tr>
<tr>
<td>03000</td>
<td>0340080100022300013014003632</td>
<td></td>
</tr>
</tbody>
</table>

   Approval recommended by:
   George R. Welch 12-10-12
   Chair, College Review Committee
   Dean of College 1-9-13
   Chair, GC or UCC

   Submitted to Coordinating Board by:

   Associate Director, Curricular Services

   Questions regarding this form should be directed to Sandra Williams at 845-8201 or sandra.williams@tamu.edu.

   Curricular Services – 02/11
PHYS 606 — Quantum Mechanics I

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 MPH 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

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

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

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 ½
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
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 607 Statistical Mechanics

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:

<table>
<thead>
<tr>
<th>Prefix</th>
<th>Course #</th>
<th>Title (excluding punctuation)</th>
</tr>
</thead>
<tbody>
<tr>
<td>PHYS</td>
<td>607</td>
<td>Statistical Mechanics</td>
</tr>
<tr>
<td>Lect.</td>
<td>Lab</td>
<td>SCH</td>
</tr>
<tr>
<td>04</td>
<td>00004</td>
<td>40080100022300003632</td>
</tr>
</tbody>
</table>

   b. Change to:

<table>
<thead>
<tr>
<th>Prefix</th>
<th>Course #</th>
<th>Title (excluding punctuation)</th>
</tr>
</thead>
<tbody>
<tr>
<td>PHYS</td>
<td>607</td>
<td>Statistical Mechanics</td>
</tr>
<tr>
<td>Lect.</td>
<td>Lab</td>
<td>SCH</td>
</tr>
<tr>
<td>03</td>
<td>00003</td>
<td>40080100022300003632</td>
</tr>
</tbody>
</table>

   Approval recommended by:

   Chair, College Review Committee 12-10-12

   Department Head or Program Chair (Type Name & Sign) Date
   Dean of College 1-9-13
  提交到协调委员会的日期
   Chair, GC or UCC Date

   Associate Director, Curricular Services Date Effective Date

Questions regarding this form should be directed to Sandra Williams at 845-8201 or sandra-williams@tamu.edu,
Curricular Services – 02/11
PHYS 607: Statistical Mechanics

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

Course meetings
MWF 10:20-11:10am in MPHY 107
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
by L. D. Landau and E. M. Lifshitz
publisher: Butterworth-Heinemann
ISBN-10: 0750633727

recommended
Statistical Mechanics, May 1990
by R. Kubo, H. Ichimura, T. Usui, and N. Hashitsume
publisher: North Holland
ISBN-10: 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.
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 611 Electromagnetic Theory

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:

<table>
<thead>
<tr>
<th>Prefix</th>
<th>Course #</th>
<th>Title (excluding punctuation)</th>
</tr>
</thead>
<tbody>
<tr>
<td>PHYS</td>
<td>611</td>
<td>ELECTROMAGNETIC THEORY</td>
</tr>
<tr>
<td>Lect.</td>
<td>Lab</td>
<td>SCH</td>
</tr>
<tr>
<td>04</td>
<td>000</td>
<td>04</td>
</tr>
</tbody>
</table>

b. Change to:

<table>
<thead>
<tr>
<th>Prefix</th>
<th>Course #</th>
<th>Title (excluding punctuation)</th>
</tr>
</thead>
<tbody>
<tr>
<td>PHYS</td>
<td>611</td>
<td>ELECTROMAGNETIC THEORY</td>
</tr>
<tr>
<td>Lect.</td>
<td>Lab</td>
<td>SCH</td>
</tr>
<tr>
<td>03</td>
<td>000</td>
<td>03</td>
</tr>
</tbody>
</table>

Approval recommended by:

[Signature]

[Date: 11/21/2012]

Chair, College Review Committee [Signature]

[Date: 12/10/12]

Dean of College [Signature]

[Date: 1/9/13]

Submitted to Coordinating Board by:

[Signature]

[Date]

Questions regarding this form should be directed to Sandra Williams at 845-8201 or sandra.williams@tamu.edu.
Curricular Services – 02/11
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

Recommended
by John David Jackson
publisher: Wiley
ISBN-10: 047130932X

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

See [http://student-rules.tamu.edu/rule07](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](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](http://www.tamu.edu/aggiehonor).
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

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)
   PHYS 615  METHODS OF THEORETICAL PHYSICS I
   
   Lect.  Lab  SCH  CIP and Fund Code  Admin. Unit  HICE Code  Level
   0 4 0 0 0 4 4 0 0 8 0 1 0 0 2 2 3 0 0 0 3 6 3 2

   b. Change to:
   
   Prefix  Course #  Title (excluding punctuation)
   PHYS 615  METHODS OF THEORETICAL PHYSICS I
   
   Lect.  Lab  SCH  CIP and Fund Code  Admin. Unit  Acad. Year  HICE Code  Level
   0 3 0 0 0 3 4 0 0 8 0 1 0 0 2 2 3 0 0 1 4 0 0 3 6 3 2

Approval recommended by:

Georges R. Wells  11/21/2012
Department Head or Program Chair (Type Name & Sign) Date

Chair, College Review Committee  12-10-12
Date

Dean of College  1-9-13
Date

Chair, GC or UCC  Date

Questions regarding this form should be directed to Sandra Williams at 845-8201 or sandra-williams@tamu.edu.
Curricular Services • 02/11
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 MPH 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

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
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

3. Change requested
   Attach a brief supporting statement for changes made to items A through D and F below:
   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:

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

7. a. As currently in course inventory:

<table>
<thead>
<tr>
<th>Prefix</th>
<th>Course #</th>
<th>Title (excluding punctuation)</th>
</tr>
</thead>
<tbody>
<tr>
<td>PHYS</td>
<td>619 MOD</td>
<td>COMPUTATIONAL PHYS</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Lect.</th>
<th>Lab</th>
<th>SCH</th>
<th>CIP and Fund Code</th>
<th>Admin. Unit</th>
<th>HIC Code</th>
<th>Level</th>
</tr>
</thead>
<tbody>
<tr>
<td>0300</td>
<td>03</td>
<td>4008020002 223000</td>
<td>003632</td>
<td></td>
<td>6</td>
<td></td>
</tr>
</tbody>
</table>

   b. Change to:

<table>
<thead>
<tr>
<th>Prefix</th>
<th>Course #</th>
<th>Title (excluding punctuation)</th>
</tr>
</thead>
<tbody>
<tr>
<td>PHYS</td>
<td>619 MOD</td>
<td>COMPUTATIONAL PHYS</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Lect.</th>
<th>Lab</th>
<th>SCH</th>
<th>CIP and Fund Code</th>
<th>Admin. Unit</th>
<th>Acad. Year</th>
<th>HIC Code</th>
</tr>
</thead>
<tbody>
<tr>
<td>0202</td>
<td>03</td>
<td>4008020002 223000</td>
<td>003632</td>
<td>6</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

   Approval recommended by:
   George R. Wells
   Chair, College of Sciences
   Date 11-27-12
   (if cross-listed course)

   Department Head or Program Chair (Type Name & Sign) Date 12-10-12
   Dean of College Date 1-9-13

   Submitted to Coordinating Board by:
   Chair, GC or UCC
   Date

   Effective Date

Questions regarding this form should be directed to Sandra Williams at 845-8201 or sandra.williams@tamu.edu.
Curricular Services – 02/11
PHYS 619 – Computational Physics (Spring 2014)

Meeting times
- Lecture: Monday and Wednesday, 12:40 – 13:30 (MPHY 213)
- Lab: Monday, 15:00 – 16:40 (MPHY 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
MPHY 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.
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.


5. Fractals (Newton-Raphson, Mandelbrodt, Sierpinsky).


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).
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.
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.
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

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:

<table>
<thead>
<tr>
<th>Prefix</th>
<th>Course #</th>
<th>Title (excluding punctuation)</th>
</tr>
</thead>
<tbody>
<tr>
<td>PHYS</td>
<td>624</td>
<td>QUANTUM MECHANICS</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Lect.</th>
<th>Lab</th>
<th>SCH</th>
<th>CIP and Fund Code</th>
<th>Admin. Unit</th>
<th>HCE Code</th>
</tr>
</thead>
<tbody>
<tr>
<td>04</td>
<td>00</td>
<td>04</td>
<td>00 80 10 00 22 30 0</td>
<td>00 3632</td>
<td></td>
</tr>
</tbody>
</table>

   b. Change to:

<table>
<thead>
<tr>
<th>Prefix</th>
<th>Course #</th>
<th>Title (excluding punctuation)</th>
</tr>
</thead>
<tbody>
<tr>
<td>PHYS</td>
<td>624</td>
<td>QUANTUM MECHANICS</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Lect.</th>
<th>Lab</th>
<th>SCH</th>
<th>CIP and Fund Code</th>
<th>Admin. Unit</th>
<th>Year</th>
<th>HCE Code</th>
</tr>
</thead>
<tbody>
<tr>
<td>03</td>
<td>00</td>
<td>03</td>
<td>00 80 10 02 23 0 1</td>
<td>00 3632</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

   Approval recommended by: George R. Welch  11/21/2012

   Chair, College Review Committee  12-40-12

   Dean of College  1-9-13

   Chair, GC or UCC  Date

   Submitted to Coordinating Board by: Date

   Effective Date

Questions regarding this form should be directed to Sandra Williams at 845-8201 or sandra.williams@tamu.edu.
Curricular Services – 02/11
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

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

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

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](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](http://www.tamu.edu/aggiehonor).
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): Department of Veterinary Large Animal Clinical Sciences

2. Course prefix, number and complete title of course:
   VLCS 422/622 Equine Disease and Epidemiology

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: 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:

<table>
<thead>
<tr>
<th>Prefix</th>
<th>Course #</th>
<th>Title (excluding punctuation)</th>
</tr>
</thead>
<tbody>
<tr>
<td>VLCS</td>
<td>422</td>
<td>EQUINE DISEASE &amp; EPIDEM</td>
</tr>
<tr>
<td>Lect.</td>
<td>Lab</td>
<td>SCH</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

   b. Change to:

<table>
<thead>
<tr>
<th>Prefix</th>
<th>Course #</th>
<th>Title (excluding punctuation)</th>
</tr>
</thead>
<tbody>
<tr>
<td>VLCS</td>
<td>422</td>
<td>EQUINE EPIDEM &amp; INFECT DIS</td>
</tr>
<tr>
<td>Lect.</td>
<td>Lab</td>
<td>SCH</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

   Approval recommended by:
   Dr. Allen J. Roussel, Jr.  1/8/13
   Department Head or Program Chair (Type Name & Sign)  Date
   Dr. Jane Walsh  1/9/13
   Chair, College Review Committee  Date
   Dr. Eleanor Green  1/10/13
   Dean of College  Date

   Submitted to Coordinating Board by:
   Chair, GC or UCC  Date
   Effective Date

Questions regarding this form should be directed to Sandra Williams at 845-8201 or sandra-williams@tamu.edu.
Curricular Services – 02/11
Special Consideration

Items
Revision of Program Request Form

Directions: An institution shall use this form to propose the modification of a degree. All sections should be completed unless noted otherwise.

"Modification (Revision) of an authorized degree title requires Coordinating Board approval before it may be publicized. Minor modifications (revisions) which do not alter the content or nature of degree programs may be approved by Coordinating Board staff upon application from an institution."

Information: Contact the System Office of Academic Affairs at 979-458-6072 for more information.

Administrative Information

1. **Institution** – Texas A&M University (College Station campus)

2. **Description** – Describe the program revision requested.

   Name change from MA degree in MODL (Modern & Classical Languages) with an Emphasis in Spanish to MA degree in HISP (Hispanic Studies) to align MA with Ph.D. We are requesting a corresponding change in CIP code.

3. **Rational for Modification** – Explain the reason for the revision.

   The degree is essentially the same; this is only a change in name to reflect the fact that Hispanic Studies is the host department, and the Ph.D. in Hispanic Studies the corresponding degree. The Modern & Classical Languages Department in Liberal Arts no longer exists.

4. **Program Inventory** – Show how the revision would appear on the Coordinating Board’s Program Inventory. Include all degree programs and corresponding Texas CIP codes affected by the change but do not include proposed administrative unit codes for the new academic unit(s).

   This program will change from 16 .0905 .00 01 – Spanish Language and Literature to 05 .0203 .00 01 – Hispanic-American, Puerto Rican, and Mexican-American/Chicano Studies. It serves to align the CIP of the MA program with its corresponding PhD program in the same department.

5. **Summarize implications for classes, distribution of personnel, availability of facilities, and availability of equipment.**

   This is a name change, which places the existing program in the correct department, Hispanic Studies in the College of Liberal Arts. There are no substantive impacts.

6. **Give information regarding any additional costs or savings.**

   None

7. **Proposed Implementation Date** – Report the date that the change would go into effect.
8. **Contact Person** - Provide contact information for the person who can answer specific questions about the program revision.

Name: Dr. Hilaire Kallendorf

Title: Director of Graduate Studies

Email: h-kallendorf@tamu.edu

Telephone: 979 458 0621

---

**Signature Page**

I understand that the Coordinating Board will update the program inventory of the institution to reflect the program degree revision, if no objections to the proposed revision is received during the 30-day public comment period.

____________________________________    _______________________
Chief Executive Officer        Date

---

2. **TAMUS Office of Academic Affairs Approval**

   *On behalf of the A&M System, I certify that the Office of Academic Affairs has approved the program degree modification.*

__________________________________________________________
James R. Hallmark, Ph.D.
Vice Chancellor of Academic Affairs        Date
Proposal for Changing MA in Modern Languages with an Emphasis in Spanish to an MA in Hispanic Studies
College of Liberal Arts
Texas A&M University
January 16, 2013

I. Impact

A. Role and Mission – Describe how the revision would affect the role and mission of the institution.

There would be no impact.

B. Program Support and Development

1. Describe how the revision would affect existing degree programs and plans for new degree programs.

The MA in HISP would simply replace the MA in MODL with a Spanish emphasis.

2. Indicate how many students and faculty there would be in the proposed administrative unit, by level and by degree program.

Currently there is only 1 student in the MA in MODL.
Currently we have 16 graduate faculty.

3. Describe how the proposed administrative unit would compare to existing administrative units at the same level (e.g., department, college, school, etc.) in terms of cost and number of students and faculty supported.

The proposed administrative unit would be the same as for the Ph.D. program in Hispanic Studies.

C. Accreditation – Explain how the change would affect accreditation or re-accreditation.

This change should impact accreditation positively since it will align the MA with the Ph.D.

D. Resources – Describe how the change would affect resources (e.g., number of employees, salaries of key administrators and faculty, the course inventory, facilities, and equipment) for the next five years.

There would be no impact.
II. Costs and Funding

Five-year Costs and Funding Sources – Use this table to show five-year costs and sources of funding for the change. (New five-year costs that equal or exceed $2 million must be approved by the Coordinating Board at one of its quarterly meetings.)

<table>
<thead>
<tr>
<th>Five-Year Costs</th>
<th>Five-Year Funding</th>
</tr>
</thead>
<tbody>
<tr>
<td>Personnel 1</td>
<td>$0</td>
</tr>
<tr>
<td>Facilities and Equipment</td>
<td>$0</td>
</tr>
<tr>
<td>Library, Supplies, and Materials</td>
<td>$0</td>
</tr>
<tr>
<td>Other 2</td>
<td>$0</td>
</tr>
<tr>
<td><strong>Total Costs</strong></td>
<td><strong>$0</strong></td>
</tr>
<tr>
<td>Reallocated Funds(^7)</td>
<td>$0</td>
</tr>
<tr>
<td>Anticipated New Formula Funding(^4)</td>
<td>$0</td>
</tr>
<tr>
<td>Special Item Funding</td>
<td>$0</td>
</tr>
<tr>
<td>Other 5</td>
<td>$0</td>
</tr>
<tr>
<td><strong>Total Funding</strong></td>
<td><strong>$0</strong></td>
</tr>
</tbody>
</table>

1. Report costs for new administrative positions and new support staff. For new faculty, prorate individual salaries as a percentage of the time assigned to administer the new academic unit and any new programs under that unit. If existing faculty and support staff will be reassigned to administer the academic unit, include personnel costs necessary to maintain existing administrative efforts and existing programs. (e.g., costs of adjuncts to cover courses previously taught by faculty who would now administer a new academic unit.)
2. Report other administrative costs here (e.g., new accreditation costs, travel directly related to administrative unit.)
3. If existing funding would be used to support the new administrative unit, indicate the funding sources and how the reallocation of funds would affect existing administrative units and programs.
4. Not generally applicable to administrative change requests. Show formula funding for students new to the institution in tables of costs and funding for new degree programs.
5. Report other sources of funding such as debt service, gifts, in-hand grants, and likely future grants that would directly support the new administrative unit.

There are no new costs associated with this change.

Signature Page

1. Adequacy of Funding – The chief executive officer shall sign the following statement:

   I certify that the institution has adequate funds to complete the administrative change and to support any new or reorganized academic unit(s). Furthermore, the change will not reduce the effectiveness or quality of existing programs, departments, schools, or colleges.

   ____________________________________________________________
   Chief Executive Officer                                  Date

3. System Office of Academic Affairs Approval

   On behalf of the A&M System, I certify that the Office of Academic Affairs has approved the administrative unit.

   ____________________________________________________________
   Frank B. Ashley III                                   Date
   Vice Chancellor of Academic Affairs
Teach-out Plan

Proposal for Changing MA in Modern Languages with an Emphasis in Spanish
to an MA in Hispanic Studies
College of Liberal Arts
Texas A&M University

Southern Association of Colleges and Schools Commission on Colleges Substantive Change for Accredited Institutions of the Commission of Colleges (Page 21).

1. Date of closure.
   Fall 2013

2. An explanation of how affected parties (students, faculty, staff) will be informed of the impending closure.

   Faculty, Staff, and Students in the College affected by the name change of the program will be notified by email and a notice will be posted on the website.

3. An explanation of how students will be helped to complete their programs of study with minimal disruption or additional expense.

   There is currently only one student remaining in the program, and that student is registered for the Spring Semester, 2013. She is scheduled to graduate in May 2013.

4. Signed copies of teach-out agreements with other institutions, if any.

   NA

5. How faculty and staff will be redeployed or helped to find new employment

   NA

6. If closing an institution, arrangement for the storing of student records, disposition of final financial resources and other assets

   NA